ENGINEERING NEWS-RECORD

Fred H. Waring: His solution for pollution p.55

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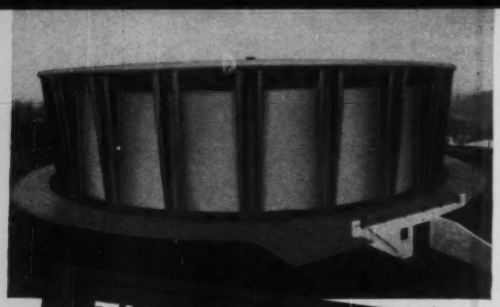

A striking example of fine appearance and exacting craftsmanship is this PDM Steel Reservoir built for the Municipal Authority of the Borough of West View, Pa., in a high-value residential district. An entire hilltop was removed to make room for the 5,000,000 gallon structure, special architectural detailing employed for visual appeal, and a two-tone blue color scheme applied to complete a most unusual and applauded neighborhood feature. • Do you have a particular water storage problem? Let us discuss it with you!

THE CONSTRUCTION QUALITY TELLS YOU it's Pittsburgh-Des Moines

5,000,000 Gallon Reservoir, 150 ft diameter by 40 ft high, built for the Municipal Authority of the Borough of West View, Pa. in Ross Twp., Allegheny County. Structure designed by William Murdoch, Consulting Engineer, Pittsburgh, Pa.

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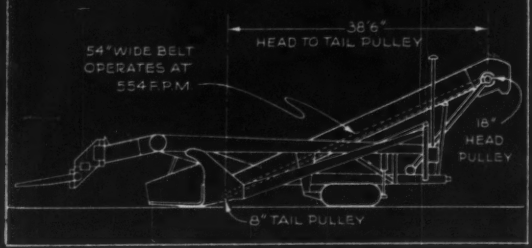
Moving mountains of earth against a deadline looked like too tough a job for conveyor-type loaders. Most work crews on this big Midwestern dam project didn't even try them—others quit when they hit the first belt-wrecking ledge of shale. But one contractor kept his loaders going full tilt. And many of them were equipped with rugged conveyor belts recommended by the G.T.M.—Goodyear Technical Man. The belts' box score: those supplied through the G.T.M. worked rings around the other brands he tried. In fact, one Goodyear belt handled a whopping 528,925 cubic yards before retirement; another loaded 329,121 yards. And both can be compared with a 235,000-yard average for all the loader belts on this job.

GOODYEAR INDUSTRIAL PRODUCTS GTM-Specified

Conveyor belting for automatic loader



Remember—you can never be sure you're getting the most out of conveyor belts—or any other industrial rubber product—until you check with the G.T.M.

It's easy to reach him in short order, too—simply by contacting your Goodyear Distributor. That's also your source for the longest-lasting, most moneysaving V-Belts, Hose and other products. Just look in the Yellow Pages under "Rubber Goods" or "Rubber Products"—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

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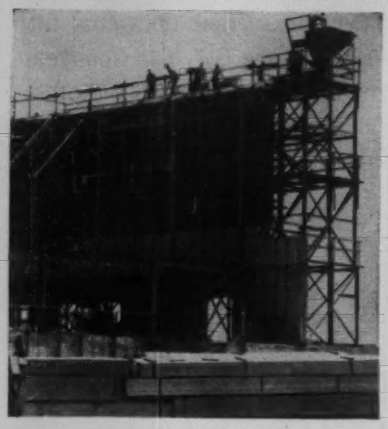
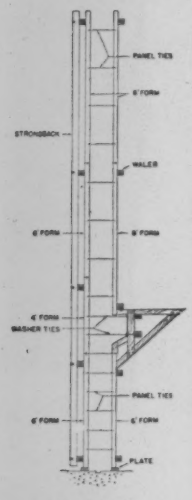


Extensive Use of Symons Steel-Ply

...Speeds Work on "Rush" Job

New, non-military, air route traffic control center building near Fremont, California will help control and direct aircraft, prevent collisions, and guide "lost" planes over a wide western area. J. H. Pomeroy & Co., Inc. San Francisco was the contractor.



The project was unusual because of the speed with which it had to be erected. The building is perhaps the first non-military structure in the west that has been designed to withstand atomic "fallout." The contractor gave careful study to the most time-saving methods. Symons Steel-Plys proved to be one of the principal time-savers. They were used on all major construction and were also adapted for pouring of large, reinforced concrete beams that were set between steel columns for blast protection.

Complete "Air Route Traffic Control Center" story sent *free* upon request. Symons Steel-Plys can be rented with purchase option.

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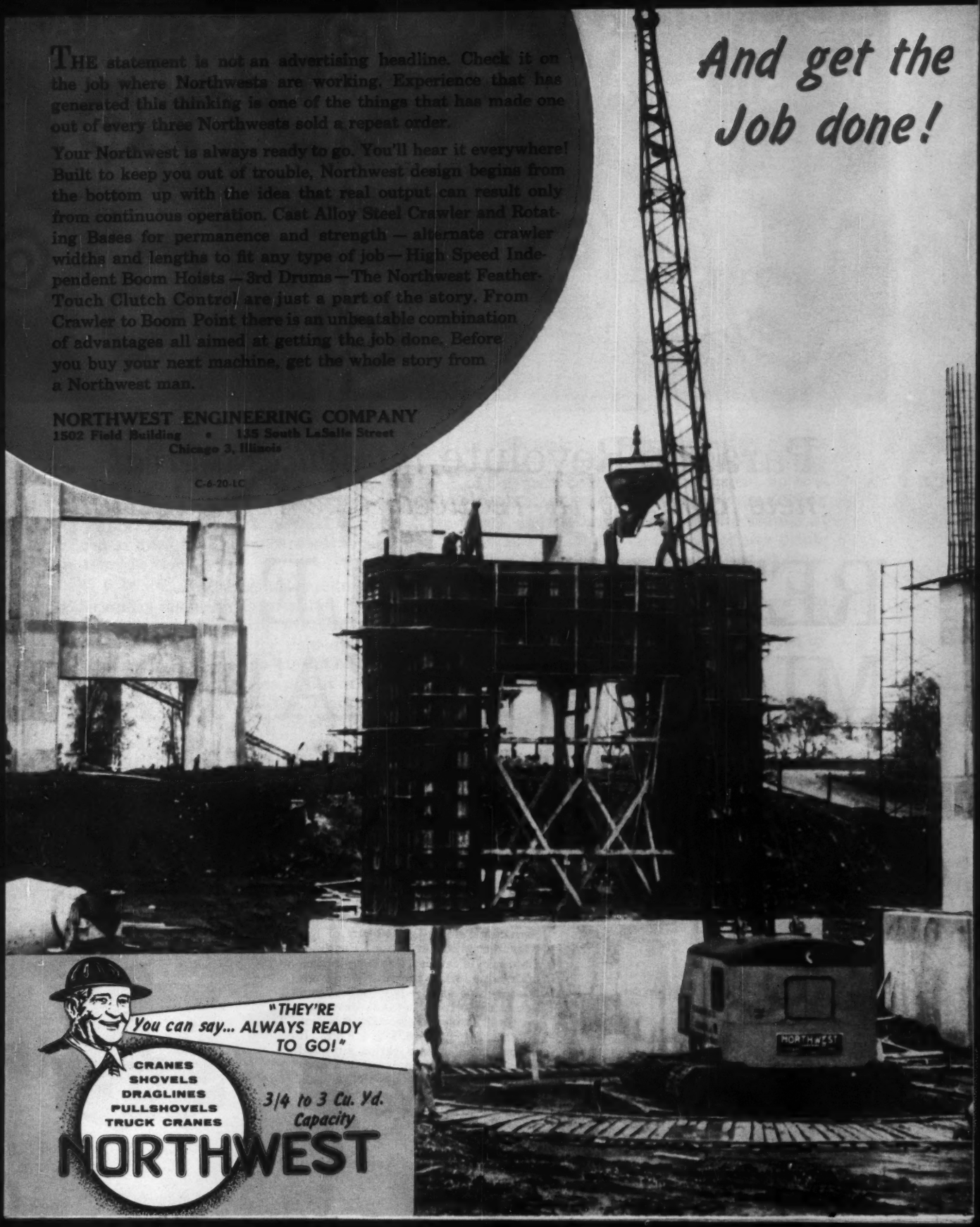

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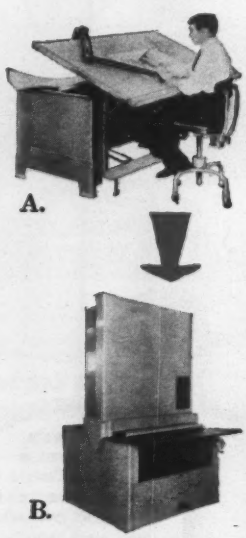
RETRIEVABLE MINIATURIZATION

The Paragon-Revolute Continuous Reducing Printer is the heart of Retrievable Miniaturization. Really a giant movie camera, it takes pictures of drawings while they move through the machine at speeds variable from 3 fpm. to 30 fpm. It takes drawings up to 42″ wide, offers reductions of 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, 1/8 size. If desired, one of two ratios supplied may be 1:1 for originals up to a maximum of 21″ wide by any length. Camera feeds the same as blueprint and whiteprint machines.



Lockheed engineers and Paragon-Revolute representatives compare half-size print with full-size drawing at Lockheed Aircraft Corporation, Missiles and Space Division, Sunnyvale, California. Lockheed officials report that Retrievable Miniaturization has given them the economies and advantages possible from reduced print size without sacrifice of valuable information on engineering drawings.

Andrew T. Johnson, (right) and Robert Johnson, owners of their own reproduction and blueprinting service firm in Boston, were the first to install Retrievable Miniaturization as a commercial service. They state: "Retrievable Miniaturization makes real sense to us — and to an increasing number of our customers. Incidentally, our Revolute Processor is doing a fine job in processing direct positive papers.

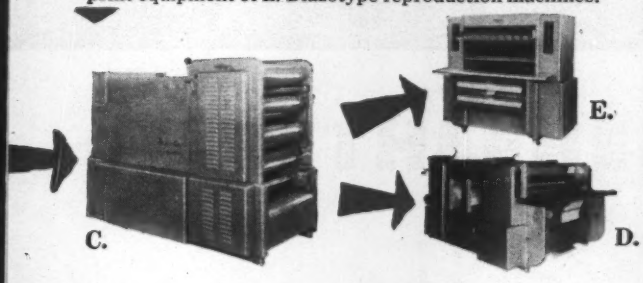
THE IDEA. Retrievable Miniaturization is a new ingenious method for reducing the size of prints yet keeping them large enough to be completely readable and usable. Developed by Paragon-Revolute, this method is acknowledged as one of the significant advancements in reproduction.

HOW IT WORKS. In Paragon-Revolute's unique Continuous Reducing Printer and Processor, reduced-size transparencies are made directly from original drawings for immediate reproduction in blueprint or diazoprint equipment. Reductions can be made as positives or negatives on paper or film. The Printer takes drawings up to 42" wide by any length at speeds up to 30 fpm.

THE ADVANTAGES. Retrievable Miniaturization fits in with existing facilities, calls for no drastic changes in present drafting standards or print-making systems. It enables savings in materials up to 300% . . . increases capacity of blueprint or diazotype equipment up to 4 times . . . slashes print handling time, filing space, and mailing costs. Most importantly, it provides readable, usable reduced-size prints without the problems and high cost of blowback systems.

You owe it to yourself and your company to investigate the advantages and savings offered by this great new concept in reproduction by mailing the coupon below.

Reduced-size prints are simple and fast to make. A. Original drawings are fed into B. Revolute Continuous Reducing Printer where they are photographed and reduced on paper or film transparencies. C. Revolute Continuous Processor develops, fixes, washes, and dries transparencies for immediate reproduction in D. Blueprint equipment or E. Diazotype reproduction machines.



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☐ Please arrange for one of your representatives to contact me about a demonstration.

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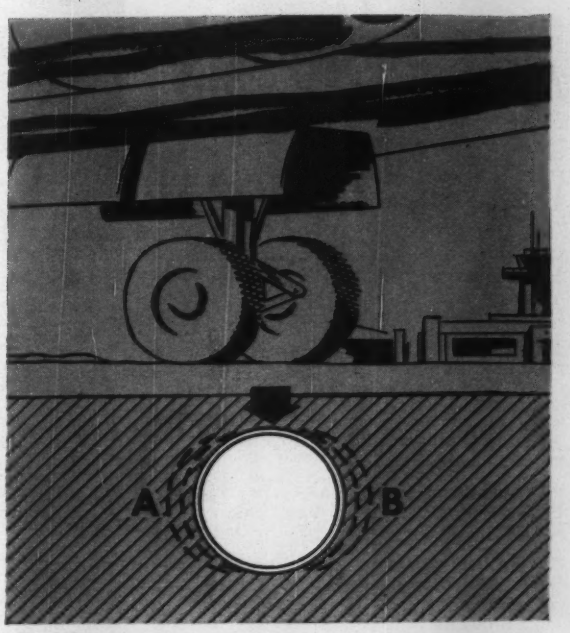
Why the thin sidewall of a Beth-Cu-Loy

A 28-ft., 16-gage Beth-Cu-Loy sheet steel culvert demonstrates its ability to flex longitudinally. This illustrates how Beth-Cu-Loy drainage structures can easily be made to conform to curves and changes in grade.

culvert pipe is the secret of its strength



Exaggerated for clarity, this drawing shows action of Beth-Cu-Loy pipe under load. Pressure against fill, at points A and B, sets up counter-loads which largely offset the forces through the vertical axis.

Looking head-on at a drainage structure made from galvanized corrugated Beth-Cu-Loy steel sheets, you might wonder how those thin sidewalls can support the load. Yet that very thinness gives Beth-Cu-Loy pipe one of its strongest advantages: flexibility.

Pipe made from Beth-Cu-Loy is flexible both transversely and longitudinally. Because of the latter, easy curves in the line can be made without special fittings or connections. But its transverse flexibility is even more of an advantage.

Makes Use of Surrounding Material

Because of this flexibility, a culvert or drainage pipe made from Beth-Cu-Loy sheets can make use of the surrounding material to support imposed loads. In the drawing above, for example, the load produces controlled deflection in the pipe. As points A and B move into and compact the trench walls, a load begins to develop around these points, spreading the pressures peripherally. Thus flexibility accounts in large part for the ability of corrugated steel pipe to carry the load.

Not so with rigid pipe of the type used for drainage. It cannot flex with the load, thus cannot transfer a significant portion of the forces to the surrounding material. The bulk of the pressure is exerted through the vertical axis of the pipe.

Bethlehem furnishes galvanized corrugated Beth-Cu-Loy (copper-bearing steel) sheets to fabricators who make culvert pipe and other drainage structures. Beth-Cu-Loy meets the specs of the AASHO. For full details, just get in touch with the nearest Bethlehem sales office, or write to the address shown here.

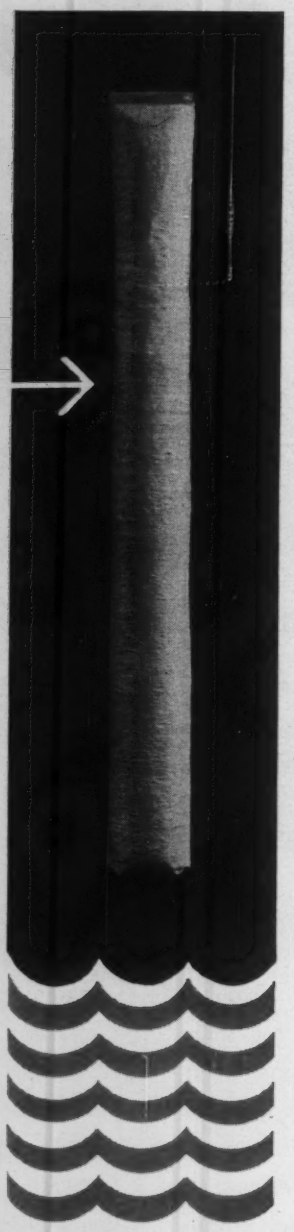
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Tailor-made to give you more efficient blasting! **BEMIS EXPLOSIVES BAGS**



Bemis Explosives Bags for ammonium nitrate and nitro-carbo-nitrate explosives are tailor-made to your requirements — to give you more efficient blasting.

More economical: Use of Bemis Explosives Bags and ammonium nitrate mixtures can save up to 50 percent on explosives costs.

Easy to fill: Bemis provides technical assistance, manufactures equipment to speed up bag filling.

Wet hole or dry hole . . . here are just a few of the Bemis Explosives Bag constructions in use:

Burlap bag with heavy-duty polyethylene liner. The rugged burlap absorbs the punishment of handling or jagged holes. Poly liner provides waterproofness.

Flexiply® bag with poly liner. Here three plies of rugged creped wet-strength kraft provide the toughness.

Laminated bags. Constructions of burlap, kraft paper, polyethylene and pliofilm — in varied combinations — are all performing satisfactorily in the pits and on construction sites.

Write today for sample bags and additional information on Bemis Explosives Bags.

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Reader Comment

Concrete Information

SIR—In reference to your editorial, "Room for Improvement," (ENR Feb. 4, p. 100) we surely agree that many field data are needed regarding actual temperature and other volumetric change effects on structures.

In observing some of the oldest prestressed concrete bridges in the United States, which were set on masonry pads without expansion provisions, it has been noted that no particular distress has occurred. On the other hand, buildings of prestressed concrete, where no consideration was given to length and configuration changes, have shown "detail" distress.

The lack of field data on actual motion that can be expected in various field structures indicates a need for an immediate field research program in that direction.

In the precast, prestressed concrete industry, there has been a peculiar situation in which temperature and volumetric changes have been sorely neglected in the building field and greatly overemphasized in the bridge field. We do not recommend that bridge shoes be set on masonry pads; however, we do feel that bridge shoes could be minimized, and that the longitudinal forces due to temperature and other volumetric changes could be better understood.

M. SCHUPACK
Schupack and Zallman Consulting Engineers
Stamford, Conn.

Mutual Ingenuity

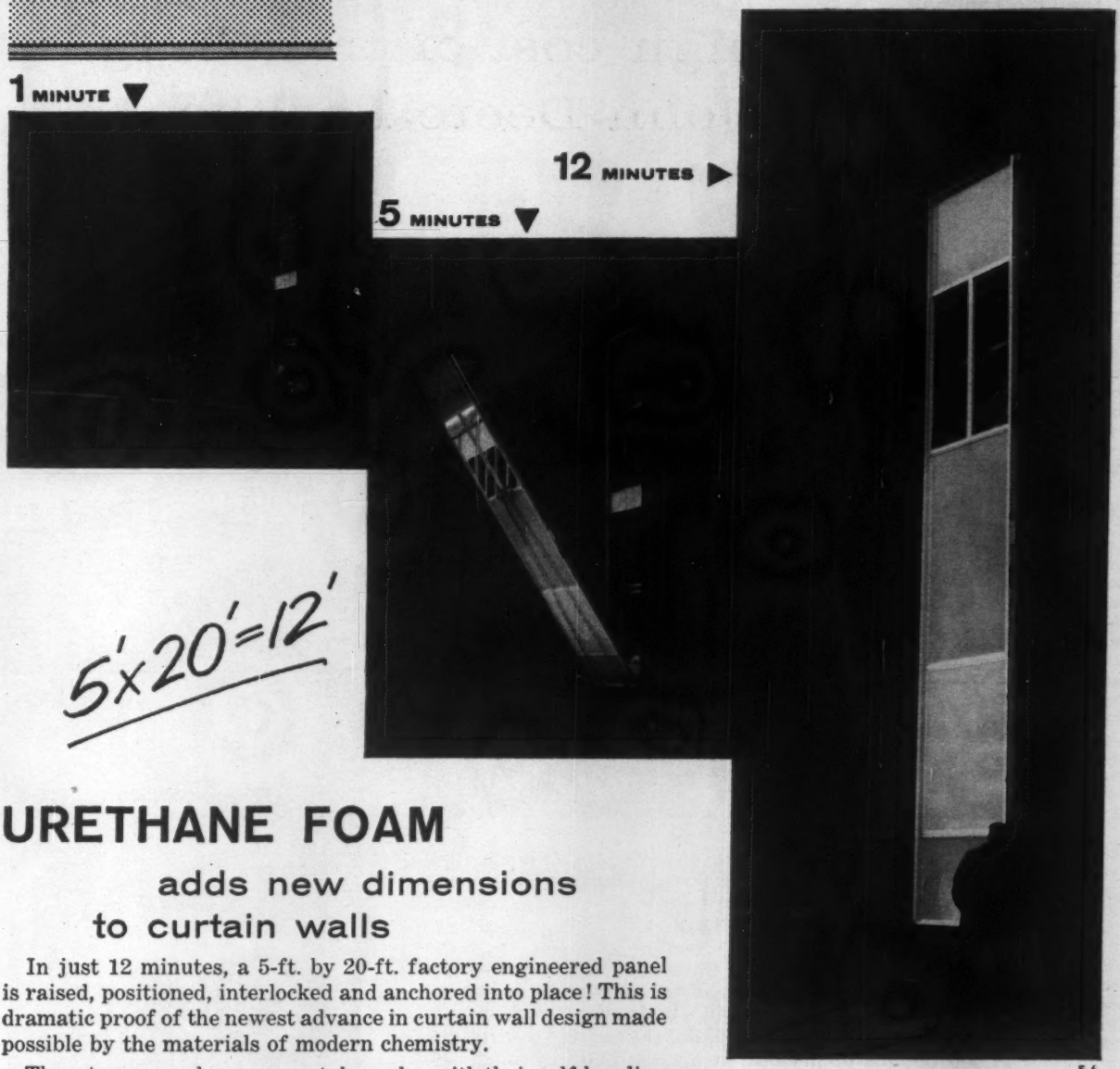
SIR—The illustration in a recent issue (ENR Nov. 26, 1959, p. 55), showing oil drums and planks used as a traffic barrier brings to mind that for several years the Michigan State Highway Department has been using sand-filled oil drums with plate guard rail bolted to them as barriers for semi-permanent installation where traffic is being diverted on to temporary roadways.

During the construction of the Edsel Ford Expressway in Detroit we used a small scale wall map that showed the roadways and structures for a progress map. On this we crosshatched the roadways for excavation and drainage progress and blocked them in for pavement with complete blocking for total construction. Contracts showed also. These

(*Reader Comment continued p. 12*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

SANDWICH CONSTRUCTION MAKES ERECTION OF 100 SQ. FT. PANELS QUICK AND EASY



F-6

URETHANE FOAM

adds new dimensions to curtain walls

In just 12 minutes, a 5-ft. by 20-ft. factory engineered panel is raised, positioned, interlocked and anchored into place! This is dramatic proof of the newest advance in curtain wall design made possible by the materials of modern chemistry.

These tongue-and-groove, metal panels—with their self-bonding cores of polyurethane foam—are light in weight, easily handled, made in sizes up to 100 sq. ft. Thin-wall design allows up to 5% more useable interior space. The stressed-skin panels stay flat; will not buckle or warp under temperature and weather extremes.

The urethane foam core is self-extinguishing; is permanently bonded; an integral part of the panel unit; has good dimensional stability and insulation properties. It is an efficient acoustical, thermo and vapor barrier that does not lose its effectiveness with aging.

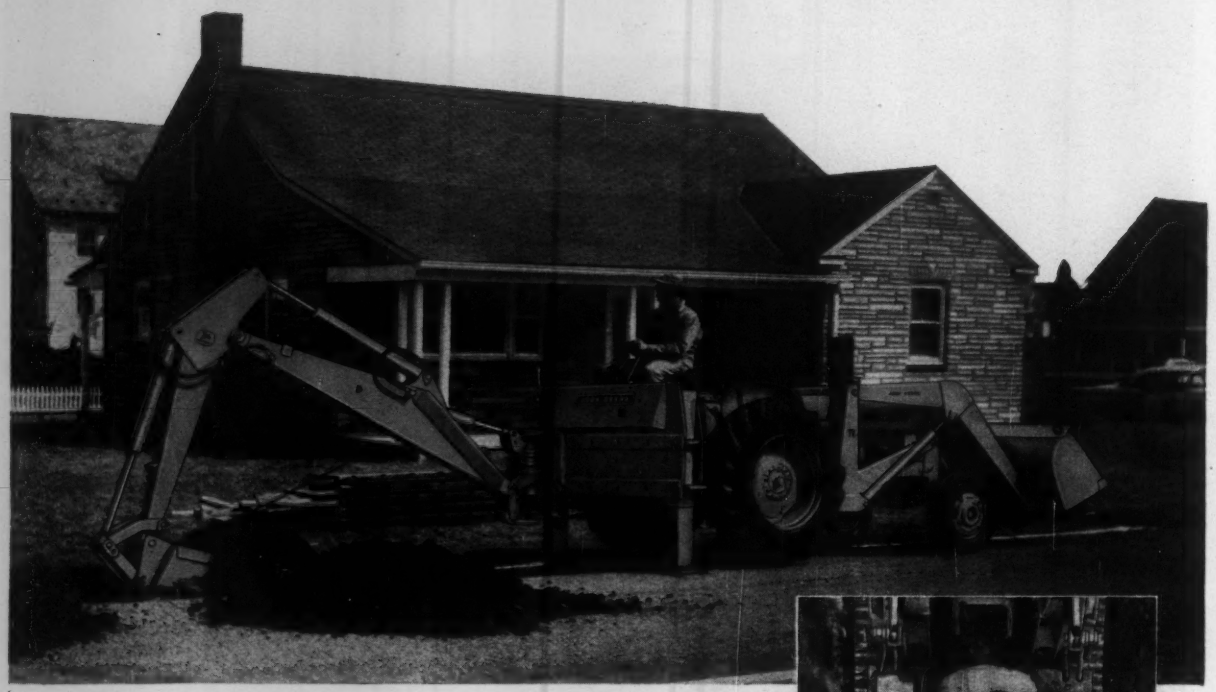
A REPORT on the use of urethane foam in curtain wall construction is available for your information and evaluation. Write for your copy.

Mobay Chemical Company
Dept. EN-1 Penn Lincoln Parkway West
Pittsburgh 5, Pa.

Mobay is the leading supplier of quality chemicals used in the manufacture of both polyether and polyester urethane foams.

MOBAY
First in Urethane Chemistry

Cut the high cost of trenching with a John Deere Backhoe



Here's power that pays off in speed—capacity that opens up more jobs for you—operating ease that means smooth, efficient work from start to finish.

Trenching along walls or fences goes fast with the flush-digging John Deere 51 Backhoe. Operator slides the rotary boom cylinder to any of five digging positions using only a wrench and the unit's hydraulic power.

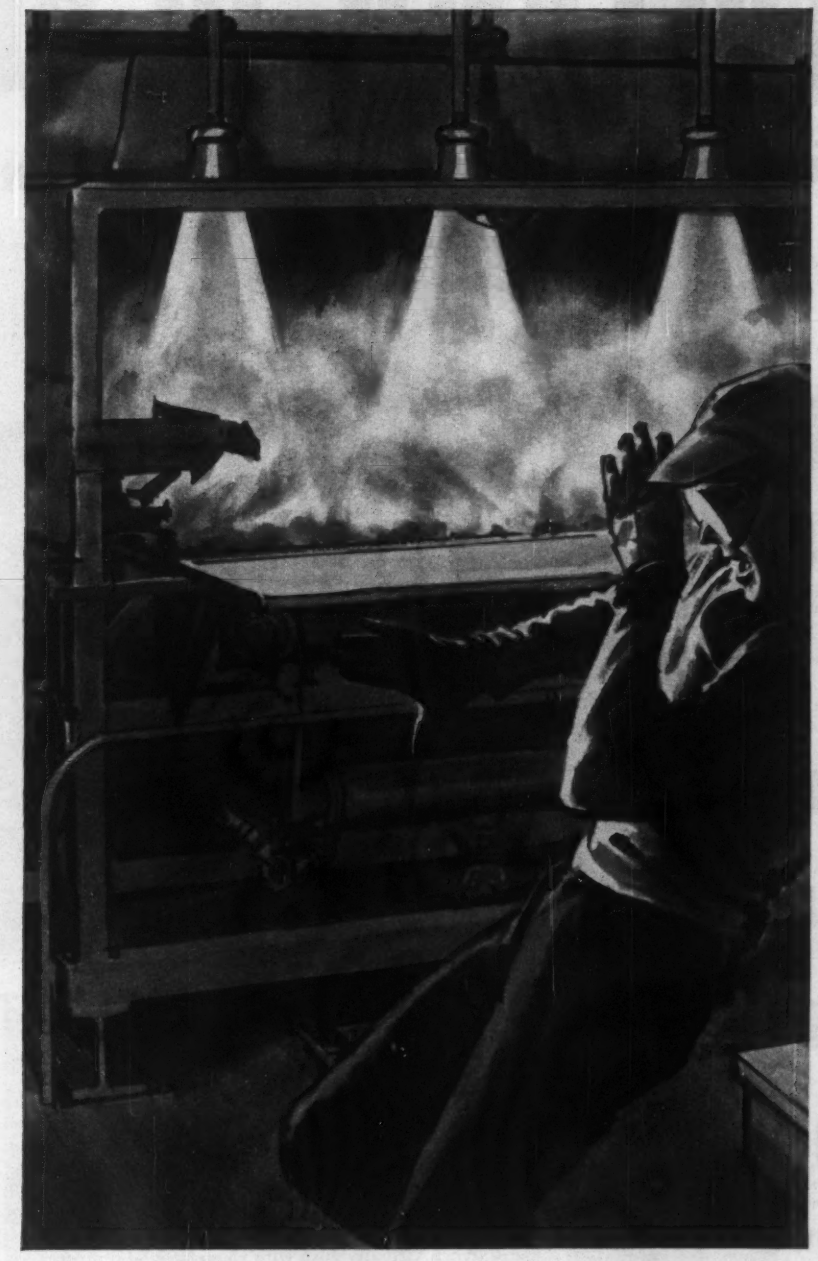
Just two operating levers do the work—control the 17,500 pounds of pry-out, swing the boom through 180 degrees, extend the bucket to 20 feet, 9 inches at ground level, dig as deep as 13 feet, 6 inches. Center-mounted 50 Backhoe with 205-degree boom swing also available. Select from wheel or crawler units with gasoline or Diesel engine power.

All units can be purchased on convenient terms of the John Deere Credit Plan. For additional information, contact your dealer through the classified telephone directory or write today.

John Deere Industrial Division
3300 River Drive, Moline, Illinois

Clean, fast work is easy with the John Deere Backhoe's 2-lever operation. Individual stabilizer controls are between operating levers.

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*



Instant bankruptcy! In a flash, fire can put you out of business. Protect dangerous flammable liquid hazards (like the coater shown above) with a *fully-automatic* Kidde carbon dioxide extinguishing system. Approved by U.L. and F.M., Kidde systems smother fire in seconds, leave no mess, turn off power and sound an alarm . . . get you back in production fast! Kidde's 35 years' experience can help you protect *any* hazard . . . write today and find out how.

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maps were photostated for distribution to district engineers and others.

This just goes to show that minds in various parts of the country do head in the same direction.

ROBERT A. PALMER
Route Location Engineer (ret.)
Michigan State Highway Department
Lansing, Mich.

Savings in Continuity

SIR—Your interesting editorial "Confidence in Continuity" (ENR Dec. 17, 1959, p 250), confirms our thinking on designing structural steel for continuity. Our office has been doing this for many years with entire satisfaction. We use this method on light-load work as well as heavy-load. We have continuous-moment floors carrying as high as 500-psf live loads.

As your editorial implied, the savings that can be made in beam tonnage for floors will run from 25% to 40%, depending on type of design used. We also find that the erected cost of structural steel beams will represent savings ranging from 20% to 30% compared with the beam cost for simple-beam design.

Note, though, that these figures are for beams only. Column tonnage changes very little in this type of design. So for most of our buildings, the net cost saving for the whole frame runs from 10% to 15%, which in this day of high steel costs represents a considerable saving for a structure designed for continuity.

VAN RENSSELAER P. SAXE
Consulting Engineer
Baltimore, Md.

Mix for Synchrotron

SIR—In the article on the shielding for the Alternating Gradient Synchrotron at Brookhaven National Laboratories (ENR Nov. 26, 1959, p. 43) requirements for ore-aggregate gradation were inadvertently misstated. I believe your readers would be interested in the correct figures for the table on p. 45, which are:

Ilmenite Aggregate	Minimum Specific Gravity	Sieve Gradation of Aggregate
Coarse	4.61	1½ to 3 in.
Medium ...	4.58	No. 4 to 1½ in.
Fine	4.65	No. 100 to No. 4

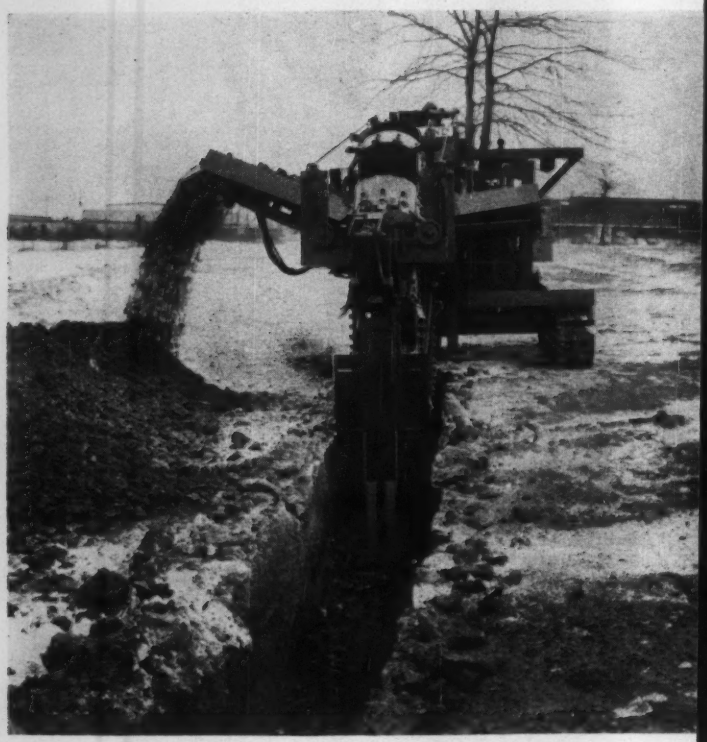
In condensing the article beginning on p. 40, the impression given placed emphasis on concreting accuracy, whereas the over-all magnet-support stability was the main requirement. To obtain this stability, a discontinuous steel girder supported on reinforced concrete pile caps was selected.

ROBERT M. JACOBS
Chief Structural Engineer
Stone & Webster Engineering Corp.
Boston, Mass.

The CLEVELAND JS-30

WITH INSTANT LATERAL

DIGGING WHEEL POWER-SHIFTS 5 FEET FROM SIDE TO SIDE



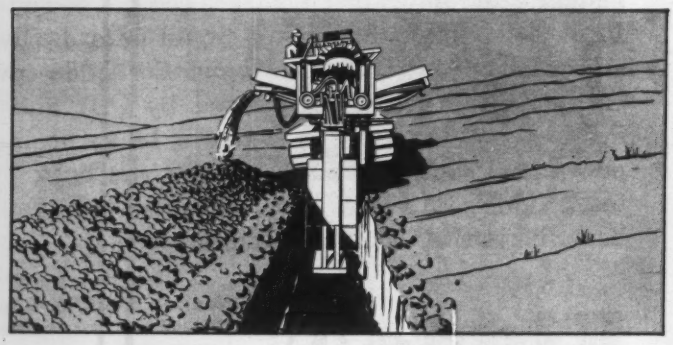
Digs trench behind either crawler or anywhere within its 6-foot width

Lateral shifting of the JS-30's wheel, up to 2½ feet to either side of center, is done hydraulically under lever control at operator's location, so trench can be dug at any point within 6-foot-wide path made by the crawler. Edge of 24-inch trench can be dug 5 inches outside either track, permitting trench to be flush with parallel pavement, curbs, sidewalks, etc. With wheel tilted, trench can be dug virtually flush with trees, poles, fences and other above-ground obstructions.

INSTANT DIGGING WHEEL TILT

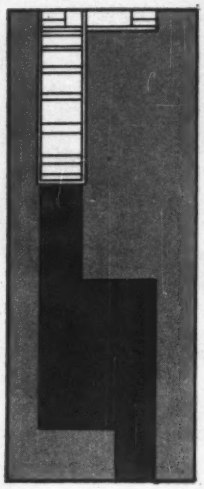
cuts blocking, cribbing costs

Hydraulic power-tilting of the JS-30's digging wheel to either side of vertical – a total tilting range of 14°– under lever control at the operator location, permits digging vertical trench on side slopes and in similar conditions with one crawler track on a higher level than the other. This eliminates the necessity of blocking, cribbing, etc. in such conditions. Power-tilt adds 7 inches to the outside cut of the digging wheel. This in combination with lateral power-shift permits digging trench virtually flush with above-ground obstructions.



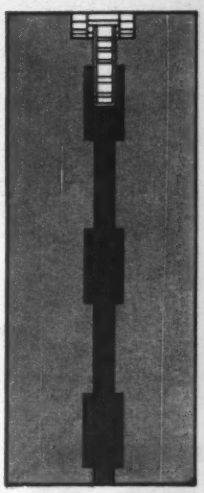
—a trencher of amazing utility

DIGGING WHEEL POSITIONING



EXCAVATES BELLHOLES saves on trench width

Power-shifting and power-tilting of the JS-30's digging wheel are especially valuable in cutting trench to extra width required at pipe joints. This permits digging trench to narrow width except where bellholes are required. By utilizing power-shift the JS-30 can dig up to 6 ft. wide, down to 5½ ft. deep — reduces slower hoe-work to clean-up, etc.



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- Pulley-enclosed, dual conveyor drives, with instant belt speed and direction control.
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POWER: 370 cu. in. diesel—59 HP @ 1250 RPM.

WIDTH: 6' over crawlers; 7' 11" over conveyor.

HEIGHT: 8' 2" digging; 9' 5" roading.

LENGTH: 27' 3".

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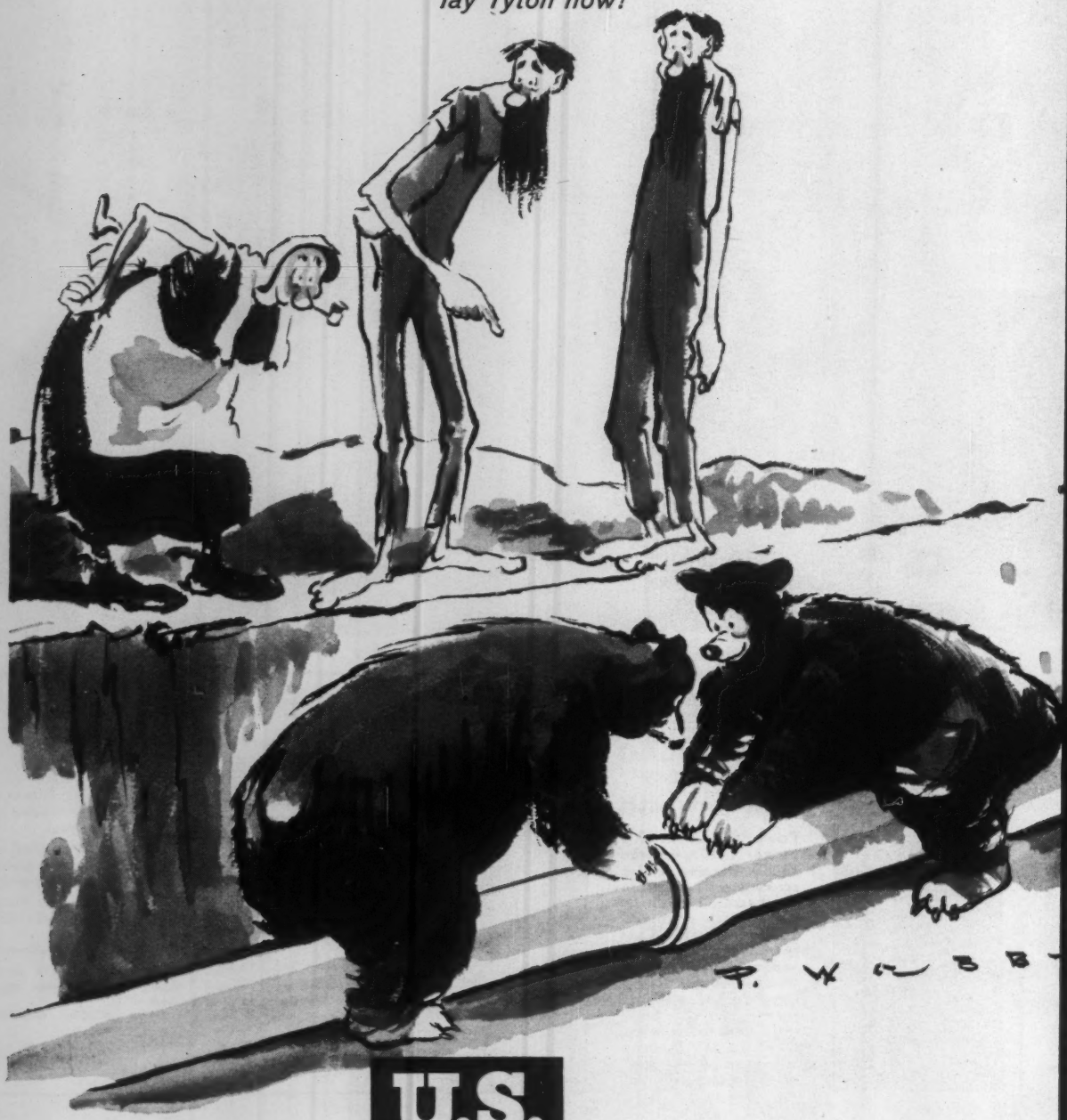

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everybody's doin' it

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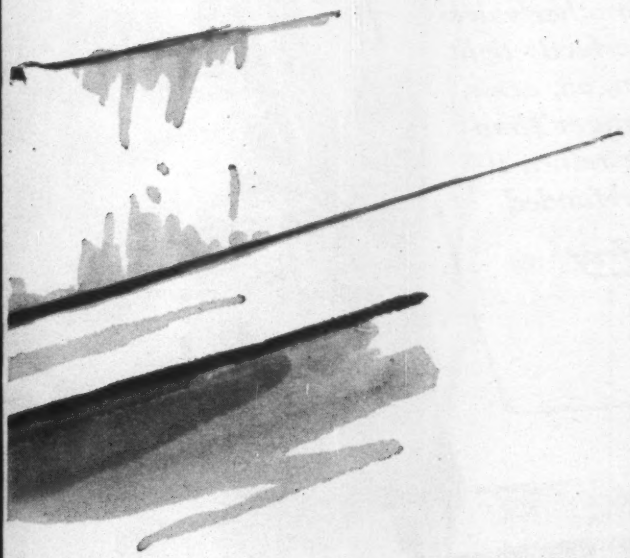

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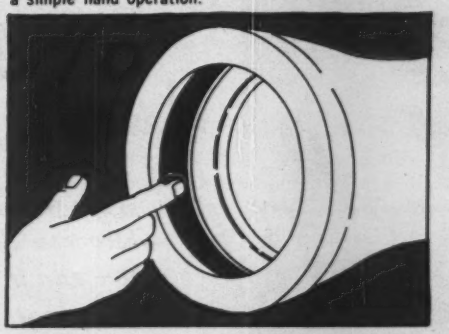
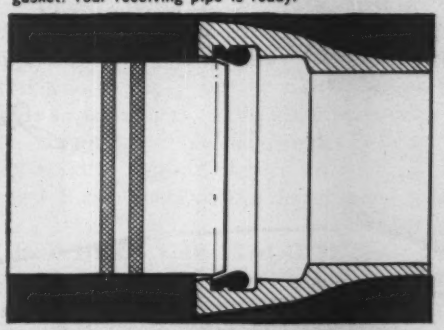
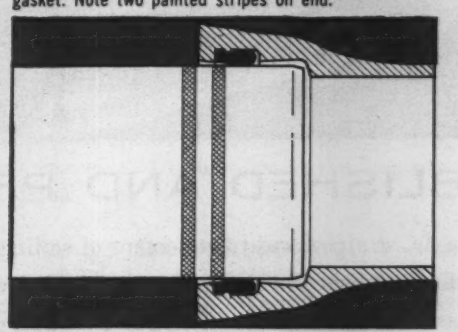


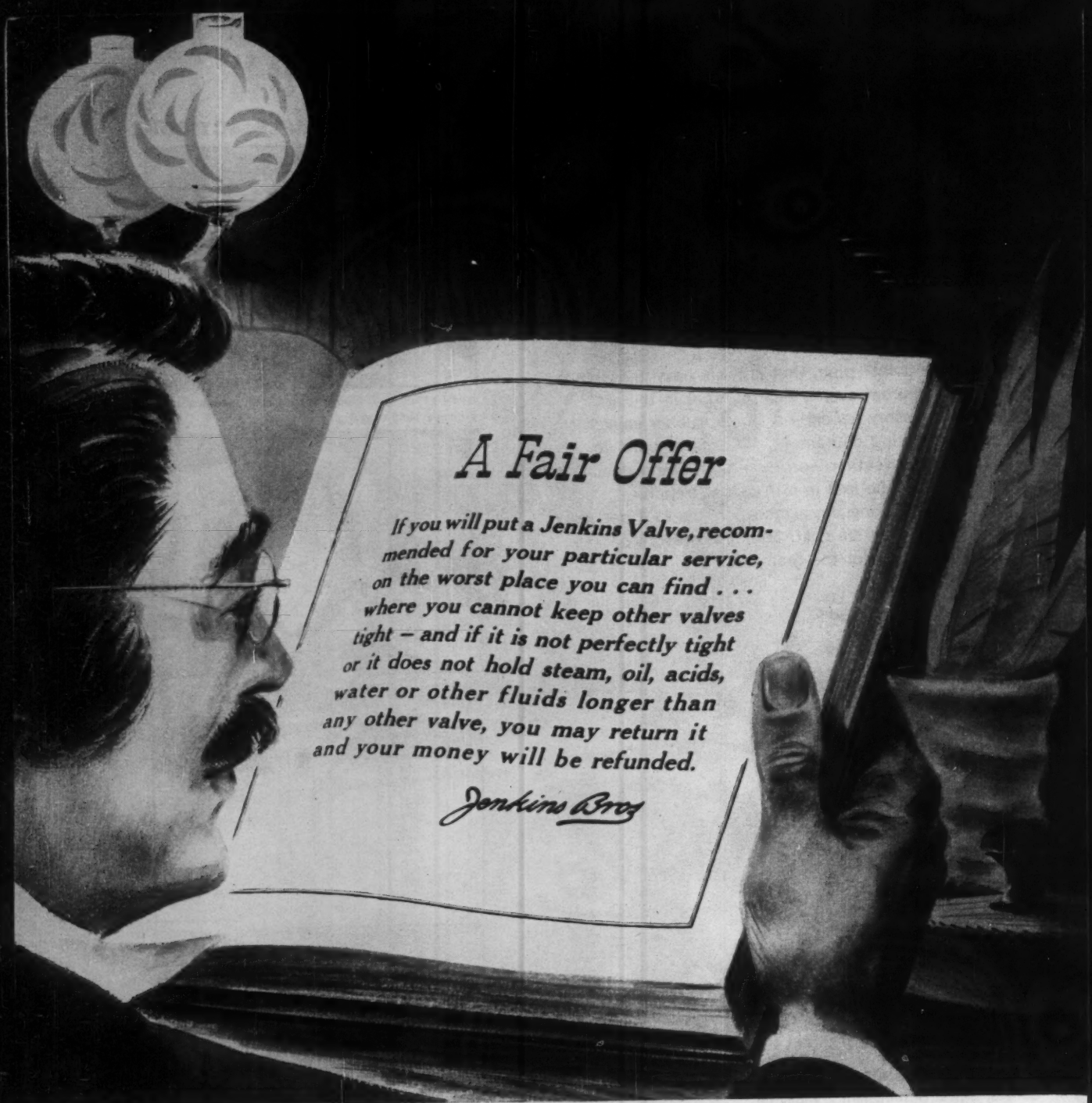
Wipe film of Tyton Joint® lubricant over inside of gasket. Your receiving pipe is ready.



Insert plain end of entering pipe until it touches gasket. Note two painted stripes on end.



Push entering pipe until the first painted stripe disappears and the second stripe is approximately flush with bell face. The joint is sealed . . . bottle-tight, permanently! The job's done . . . . fast, efficiently, economically. Could anything be simpler?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THE CONSTRUCTION WEEK

ANOTHER PILOT DESALTER—Blaw-Knox Co., Pittsburgh, will build the second direct-freeze pilot desalting plant, under a $141,430 Interior Department contract. Although a seacoast site for the 35,000-gpd unit has not been picked as yet, completion is scheduled for early this fall.

PITTSBURGH BEATS SLUDGE ODOR—Four weeks or odorless sludge incineration signal imminent success for a four-month effort of the Allegheny County Sanitary Authority. Since last October, the authority has been trying to track down and eliminate the cause of odors that forced the shutdown of incinerators at the new Woods Run Sewage Treatment Plant (ENR Oct. 22, 1959, p. 17). The cause seems to have been that drying gases escaped without coming in contact with the flames.

RAILROAD COMEBACK—Railroads in Germany and Italy still think they have a future. In Germany 94% of the 3,320 railroad bridges destroyed and damaged in the war have been rebuilt. In Italy a five-year plan of railway electrification will end next year with 4,800 miles of the country's 10,000-mile rail net using kilowatts instead of coal.

TRADE UNIONS DRAW THE LINE—The AFL-CIO has been warned not to go too far in its efforts to solve conflicts between craft and industrial unions. The Building and Construction Trades Department last week said it would support arbitration machinery to handle such conflicts—if the machinery meets these criteria: It must cover specific disputes only, not basic jurisdiction; and it must provide effective safeguards to protect the interests of the department's affiliates.

HOME IS WHERE THE STADIUM IS—It looks as though the Phillies will stay in Philadelphia, although a consulting engineer's survey last year okayed a New Jersey site for a new stadium (ENR Feb. 5, 1959, p. 17). A law creating a Phillies' stadium authority recently struck out in the New Jersey State Legislature.

FIT TO BE TIED—The Seaboard Air Line Railroad is installing prestressed concrete crossties on a ¼-mile section near Tampa, Fla. Believed to be a U.S. first, the new ties are said to cost less in the long run than conventional wood ties.

LATEST SLANT ON PARLIAMENT—The British Minister of Works admits that two of Parliament's towers aren't in top form. The 329-ft-high Big Ben tower and 336-ft-high Victoria tower are each 15 in. out of plumb. Engineers believe that it may be due to wartime bombing. A Labor MP's remark on the matter: "May I suggest that the Minister get things straightened out as soon as he can?"

HOW TO HANDLE WET JOBS

#54 of a Series

Project: Sewage Treatment Plant, Jacksonville, Fla.
General Contractor: Sullivan, Long & Hagerty, Birmingham, Ala.
Engineers: Metcalf & Eddy, Boston, Mass.

Despite large volume of air entering wellpoint system...

One Pump Controls 24′ of Water on big job

Predrainage requirements for this wet site were as follows: (1) Lower ground water from elevation 108 to elevation 84. (2) Use single-stage system (not expensive two-stage system) inside a 2,000-ft perimeter. (3) Handle large air volume in the pumping. (4) Install wellpoints in sand wicks to operate dependably in the job-site's fine sand and clay.

- **The Griffin plan** used by the contractor—and supervised by a Griffin specialist—was based on long experience in the region.
- **Photo shows** the results: excavation kept dry and stable—24 ft of ground water gone. Contractor's cost? Well below estimate. Call Griffin for *your* wellpoint work.

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WASHINGTON OBSERVER

- **Democrats want more construction money**
- **Pennsylvania wants to 'buy American'**
- **As American as apple strudel?**

● **A $2-billion increase in spending on non-military projects—much of it involving public works construction—is recommended** by the Democratic majority of the Joint Economic Committee of Congress. Specifically mentioned are school aid, slum clearance, water development and aid for depressed areas. Such projects are now "starved for funds" the report states.

To pay for the increased outlays, the report recommends a series of changes in the tax laws to raise $2.5 billion in additional revenue. Among the changes: Repealing the special tax relief on income from dividends; cutting subsidies now paid to agriculture and some businesses (which ones aren't specified) to the extent of $1 billion a year.

Democrats say this combination of moves would pay for the increased outlays and produce a $5-billion surplus, compared to the $4.2-billion surplus the Administration is hoping for.

Republicans on the committee dissent. They accuse the Democrats of insincerity, dishonesty and "childish arrogance."

● **A group of Pennsylvania officials, led by Gov. David Lawrence, asked Secretary of Commerce Frederick Mueller** on Monday to reconsider a Bureau of Public Roads memorandum requiring highway departments to accept foreign bids for cement and steel for federal-aid highways if they are more than a certain percentage below U. S. suppliers.

The Pennsylvania officials say their cement and steel plants would lose substantial quantities of business to foreign firms if the rule is allowed to stand. They said they wanted Pennsylvania's highway department left free to permit contractors to buy domestically regardless of bid differentials.

Mr. Mueller promised only that he would take the plea under consideration. He gave no indication that he would rule quickly one way of the other.

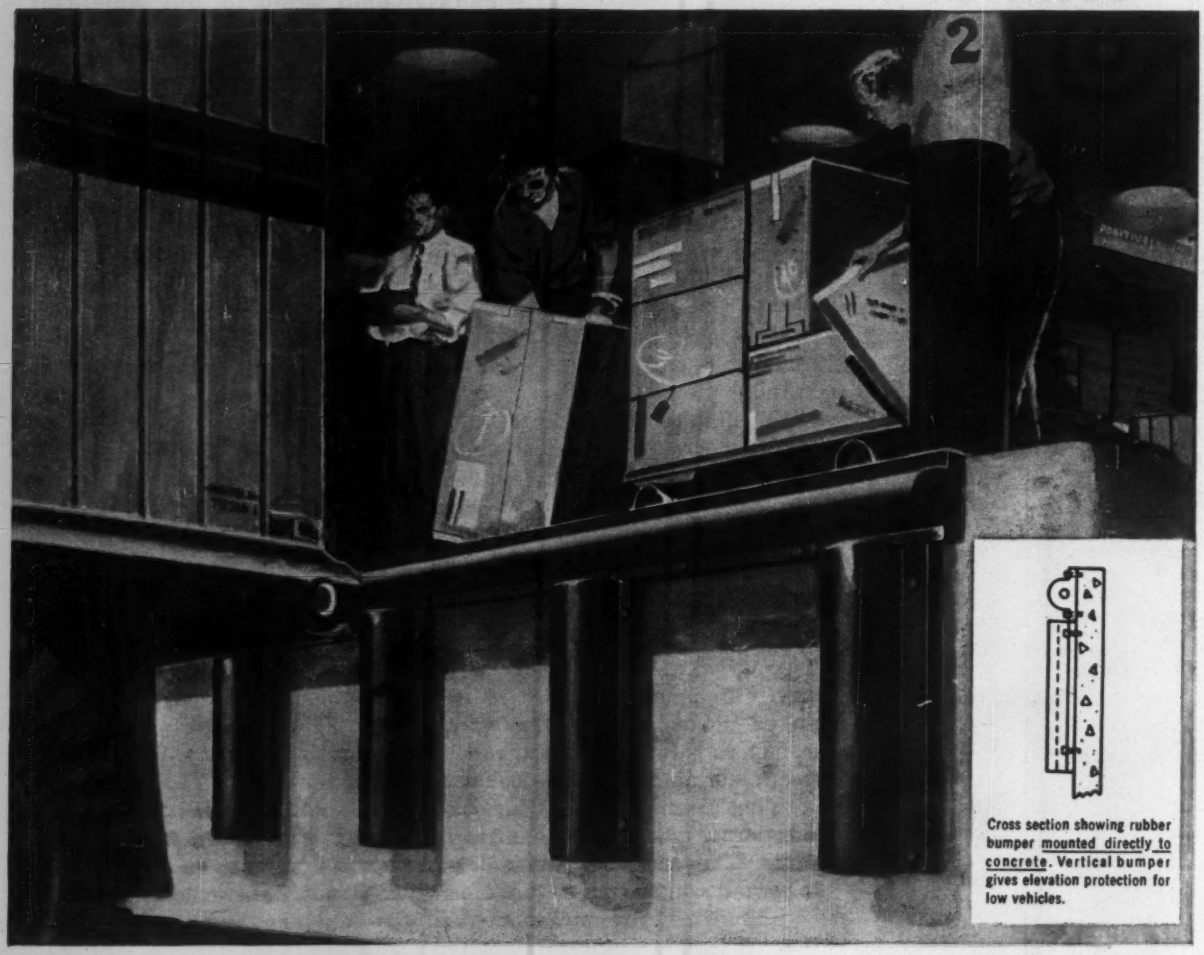
The BPR memorandum allows highway departments to give suppliers from areas of substantial unemployment a 12% price differential, suppliers from areas without critical unemployment get only 6%. It became effective this week.

The Pennsylvanians say that although their cement plants are not in areas of critical unemployment, many of their workers are from such areas. Cement and steel suppliers are the major buttresses of the state's economy, they point out.

● **The government has run into difficulty on its first attempt to devise a formula to determine when foreign purchases make a company a foreign concern** when it comes to bidding for government contracts. The case involved: Baldwin-Lima-Hamilton's $6-million bid on eight Glen Canyon hydro turbines.

Bureau of Reclamation's form, submitted to the company to fill out, is being discarded as unsuitable by both company and the government. From here on, such determinations will be made on an individual basis. General Accounting Office still has to rule on whether the company's purchases of components overseas make it legally a foreign bidder.

US RUBBER TRUCK DOCK FENDERS



Cross section showing rubber bumper mounted directly to concrete. Vertical bumper gives elevation protection for low vehicles.

How to stop being a rail splitter

Give up using wood timbers across the face of truck depots. You'll not only stop being a rail splitter, but you'll stop denting the trucks.

A case in point: Recently a new truck terminal was equipped with the usual wood timbers across the face of the dock. Within the following week, the wood timbers were splintered and bruised by trucks backing against the dock.

Then U. S. Rubber Truck Dock Fenders were installed. These fenders have been on the job for over six months so far and they have prevented any damage to the dock or the trucks. They have a neat appearance (no ragged, splintered look), are easily installed, will withstand batterings from battalions of trucks.

• • •

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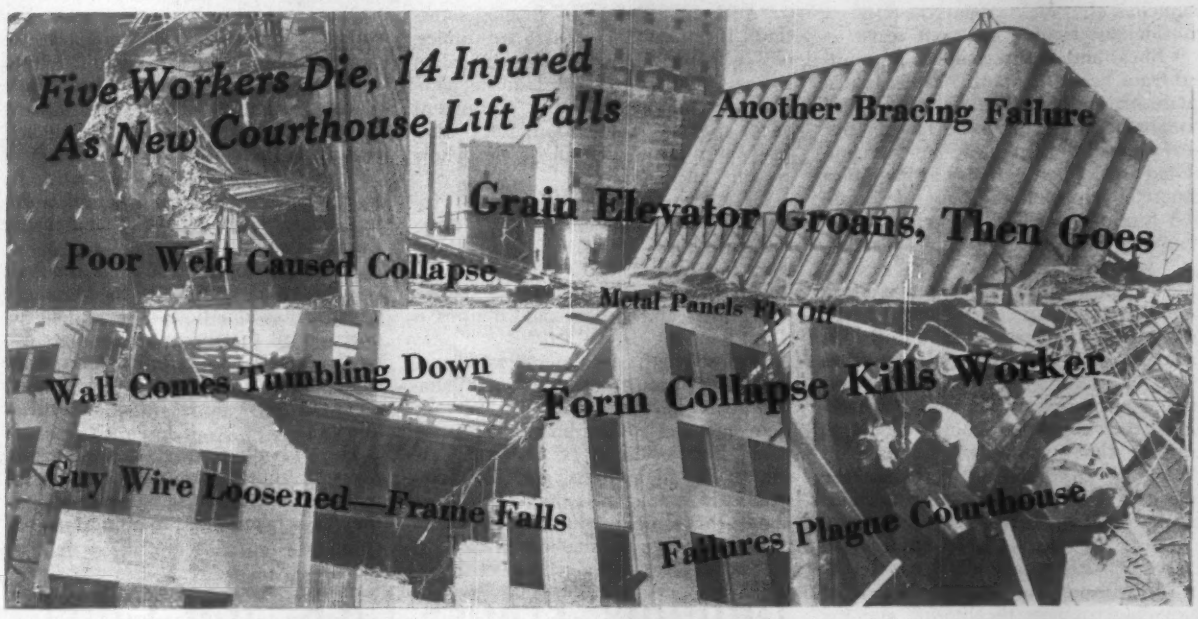
Five Workers Die, 14 Injured As New Courthouse Lift Falls
Another Bracing Failure
Grain Elevator Groans, Then Goes
Poor Weld Caused Collapse
Metal Panels Fly Off
Wall Comes Tumbling Down
Form Collapse Kills Worker
Guy Wire Loosened—Frame Falls
Failures Plague Courthouse

Failures: Too Often, Too Similar

Structural failures, both during construction and in completed buildings, continue to plague the construction industry. Yet the same mistakes crop up again and again—and almost invariably they can be attributed to one of these four categories of causes: faulty design practice; oversight in design; faulty construction; faulty bracing (so common it forms a category of its own).

That was the major point of a panel of three noted engineers, which discussed failures at a technical meeting of the New York Chapter of the American Institute of Architects last week. On the panel were Jacob Feld, consulting engineer; Boyd G. Anderson, partner in Ammann & Whitney, consulting engineers, and ENR Senior Editor Frederick S. Merritt.

A frequent faulty design practice is changing the design without the knowledge of the original designer. This often occurs after the original design has been completed. Design agreements or contracts between owners and architects and engineers should always include a clause requiring all plan changes to be approved by the original designer.

Another faulty design practice leading to failures is poor drafting and insufficient checking of drawings. In one failure—a collapsed retaining wall—investigators found that ¼-in-dia bars were the main vertical reinforcing. The bars should have been 1¼ in. dia, but on the drawing the 1 was obscured by a dimension line drawn over it.

Thorough checking for errors is an added design expense, but worth every cent it costs. This is a step-by-step process—design, design check, drafting, drafting check, detailing, detailing check.

The cost of this work can run up to 20% of design cost for a building, according to Mr. Anderson. Services provided in this phase of the work should be set down in clear-cut terms between architect and owner, and architect and engineer before work begins. In short, areas of responsibility should be decided before the start of a project and the procedure followed through to the end of the job.

Too often, design contracts do not include provisions for supervision of construction. It is not only important that the designer also supervise the field work, but the extent of the supervision should be spelled out in the architect-engineer agreement. Is supervision to be continuous throughout the life of the job? Will it cover all parts of the project or only specified stages and parts of the work? Those questions should be answered in the contract.

Should the engineer alone be responsible for the integrity of a completed structure? Mr. Anderson maintained that at the end of the job the contractor must be the one to certify that the work is in accordance with plans and specifications. He said that while the engineer, through inspection, will try to protect the owner's interest and will call to the architect's attention any errors observed in erection, the engineer cannot assume any of the contractor's responsibility.

"Transplant" designs of plans made for another site or quick redesign of standardized plans provide too many opportunities to overlook changes. And also in the area of design practice, care should be taken to include design checks and approval by an engineer when construction bids include design as well as fabrication and erection.

Design oversight includes a number of errors that recur frequently:

- **Inadequate attention to thermal effects is one.** Exterior walls may crack if roof slabs contain no expansion joints or provision to resist thrust from temperature rises. Another error is ignoring the effects of shape changes due to loads: for example, corner curling and the lift produced by this slab action.
- **Insufficient bearing by framing on walls and wall or lintel failure** can cause collapse in wall-bearing structures.
- **Short reinforcing steel and insufficient or badly placed laps** cause too many beam failures. The condition is particularly bad if a surface can be passed through a beam section without

cutting reinforcing steel. And even where there is continuity in reinforcing, plains of weakness will follow a lap. Short laps or steel cut short at or near haunches of concrete bents have given considerable trouble in recent years.

• **Shear and flexure reinforcing omitted from beams** is another fault. Inadequate analysis of both concrete and steel designs accounts for some failures not only during construction but in completed structures. Analyzing complex concrete shapes on the basis of simplified formulas for lack of accurate criteria has also led to trouble, particularly with thin shells.

Unequal building settlement is often caused by a wrong "guess" on the type of foundation for the ground and load conditions. Foundation designs are often based on widely spaced test borings. During excavation and construction, the engineer should check to confirm the assumptions he used in designing, and modify or change the foundation design where soil conditions change suddenly across the site.

There are cases where failures occurred at footings actually "suspended" in soil without any bearing. Instead of providing support, the footing and the column above it acted in reverse, adding a load to the structure and increasing loads in the surrounding bays and columns.

Faulty construction practices cover sins of commission as well as omission. Responsibility is often split between engineer and builder. Here are a number of recurring examples:

• **Too many holes**—sometimes designers call for too many openings for pipes and ducts. Collapse of a four-story concrete structure during construction probably was caused by excessive punching shear—holes were specified along two sides of the columns, and the reinforcing was made discontinuous. Mechanical, electrical, heating and plumbing drawings should be compared carefully with structural and architectural plans to avoid opening concentrations in floors or structural members.

• **Completed frame erection without permanent connections or installation of floor systems** is another source of trouble. Often in the interest of speeding field operations, contractors leave frames with temporary connections until erection has been completed. Wind, or an inadvertent blow from construction equipment, or force fitting a single member may cause collapse.

• **Faulty bracing**—both in design and during construction—accounts for a sizable proportion of recent building failures.

In construction, merely tying members together with temporary bracing may only insure that more members collapse when a failure occurs. Bracing should transmit lateral loads imposed on the superstructure down to suitable foundations in the ground.

"Adequate" temporary bracing sometimes is not enough. There are numerous collapses that were triggered when a single guy was loosened during construction to make way for equipment or for an erection operation. Often that guy was the one that made the whole system "adequate."

Designers cannot rely on walls for bracing during erection of the frame—the walls may not be in place at the time they are needed. Complete bracing in both directions between beams and girders and girders and columns is a must.

High-strength steel members require careful attention to bracing. Such members may be more unstable laterally than members of ordinary structural-grade steel. This is because they are subject to high stress and are comparatively small in section but have about the same modulus of elasticity as structural-grade steel. Mr. Merritt pointed out that resistance to buckling is generally more dependent on modulus of elasticity than on strength in steel.

Shoring for concrete formwork has collapsed on a few occasions because of inadequate bracing. It is difficult to avoid lateral forces on a form while placing concrete. These forces must be carried to the ground. Diagonal bracing is preferable for the job. And on high formwork, safe practice is to top off shores with a complete intermediate level at 16 ft and begin shoring a second time.

Mr. Feld commented that the best way to avoid failures is to encourage a wide dissemination of complete reports on all that occur. "No cures can be developed," he said, "or preventive rules standardized, unless information on what has caused prior failures is known."

He said it was discouraging that so many of the failures over a period of many years appear so similar, though they have taken place in all parts of the country.

Building Trades Pick New Chief

A trim looking, sophisticated man, who knows his way around in political circles and who is considered an accomplished and persuasive speaker, was elected president of AFL-CIO Building and Construction Trades Department last week.

He is Cornelius J. Haggerty, 66.

Mr. Haggerty is a member of the Lathers Union and executive secretary-treasurer of the California State Federation of Labor, AFL-CIO.

He will take office on April 1, succeeding Richard J. Gray, who announced his retirement last month after 14 years of departmental service (ENR Feb. 11, p. 90).

A native of Boston, Mr. Haggerty began his labor career in 1915, when he joined Boston Local 72 of the lathers union. He moved to California in 1921 and later became business manager of the lathers local in Los Angeles, where he still resides.

Mr. Haggerty has been active in labor affairs on the local, state and national levels for nearly three decades.

After serving as secretary of the Los Angeles Building and Construction Trades Council, he became president of the California State Federation of Labor, AFL. When the state AFL merged with the CIO in 1958, he became head of the merged federation.

He has been instrumental in steering a number of union-sponsored measures through the state legislature and conducted a successful union drive to defeat a state right-to-work proposal in the 1958 election.

Cornelius J. Haggerty

His public service includes work with the Federal Advisory Council on Employment Security, National Housing Conference, International Labor Press Association and the Governor's Council on California Department of Employment. In 1959 he became the first labor man to be appointed to the University of California Board of Regents.

Mr. Haggerty is a member of the American Legion, the Commonwealth Club of California, Town Hall (Los Angeles) and Press and Union League Club (San Francisco).

Sewerage-Aid Veto Won't Slow Work

Construction of sewage treatment plants will continue at about the same level as last year despite the President's veto of a bill to double construction grants. The House failed by 22 votes last week to override the veto (see editorial, p. 92).

The water pollution bill, with real grass-roots pressure behind it, was the one measure Democrats felt had the best chance this year of surviving a veto. Of the 158 vetoes the President has used since he took office, only one—last year's public works bill—has been overridden.

Congress is expected to appropriate the same amount of money as last year—$45 million of the $50 million it is authorized to spend each year. This will be divided among the states according to population and wealth.

State governments, which assign priorities to the cities, now have some 500 applications on file and another 500 in preparation. All but $15 million of the current year's appropriation has already been committed. Federal authorities have claimed they could easily spend double the current amount in meeting the demand of states for federal matching money.

The President said in his veto message that water pollution is "a uniquely local blight" and that a large-scale program of federal support would tempt cities to delay local efforts while waiting for federal funds.

This has not happened so far. Before the federal program went into effect, sewage treatment plant construction projects averaged about $220 million a year. In 1959, local projects outside the federal program still amounted to $210 million. This is in addition to matching money the states put up to get federal grants.

In fact, the aid program has probably helped create a surge in both actual and planned sewerage construction during the last half of the 1950s (although the general upsurge in building has been more influential). Annual sewerage construction rose about twice as fast from 1955 to 1959 as it did during the preceding five years. The backlog of sewerage projects rose nearly a billion dollars during the same period. These figures include all sewerage construction.

Instead of stepping up the federal program, President Eisenhower said he would call a national conference on water pollution next December which would "help local taxpayers and business concerns realize the obligation they have to help prevent pollution." He will also ask for a small increase in research funds and tighter enforcement procedures.

. . . Construction up since federal aid began

(In millions of dollars)

State and Region	Backlog Jan. '56	Contract Awards 1956	1957	1958	1959	Backlog Jan. '60
U. S. TOTAL	**$2,979**	**$578.8**	**$556.0**	**$617.8**	**$655.2**	**$3,850**
NEW ENGLAND	137	27.7	22.1	36.2	29.9	281
Maine	5	0.5	0.7	1.5	0.5	11
New Hampshire	5	0.1	0.7	1.6	1.9	15
Vermont	2	0.4	0.1	0.7	2.6	12
Massachusetts	59	9.0	8.9	21.2	11.5	77
Rhode Island	38	7.7	0.5	0.9	2.4	34
Connecticut	28	10.0	11.2	10.3	11.0	131
MIDDLE ATLANTIC	558	194.4	106.0	151.1	140.5	680
New York	335	46.4	48.3	63.9	71.3	328
New Jersey	38	17.9	8.3	27.1	16.0	127
Pennsylvania	144	101.0	34.5	41.2	36.7	162
Maryland	23	15.2	8.9	13.0	12.0	36
Dist. of Columbia	5	12.4	4.9	5.7	3.2	17
Delaware	10	1.5	1.1	0.2	1.3	9
SOUTH	395	74.9	47.1	74.9	127.7	559
Virginia	68	13.0	3.4	1.9	5.3	79
West Virginia	45	3.3	1.2	5.2	13.0	38
North Carolina	35	11.3	8.8	7.0	16.0	45
South Carolina	15	0.3	.....	1.9	3.2	26
Georgia	31	.....	4.2	6.5	13.6	41
Florida	55	10.3	11.2	15.1	31.3	111
Alabama	28	3.7	0.6	11.1	12.0	47
Mississippi	7	0.4	.....	4.9	4.3	12
Louisiana	24	6.8	8.7	9.7	8.9	55
Kentucky	42	16.1	6.2	9.1	11.2	50
Tennessee	47	9.7	2.8	2.4	8.9	55
MIDDLE WEST	787	135.2	176.4	153.3	149.9	1,050
Ohio	304	41.0	54.3	48.0	34.0	373
Indiana	67	5.5	19.7	28.4	20.9	42
Illinois	155	33.3	48.1	36.1	69.3	260
Wisconsin	35	19.5	22.2	17.5	16.1	76
Michigan	225	35.9	32.1	23.3	9.6	300
MISS. TO ROCKIES	594	80.5	86.3	109.9	92.0	588
Minnesota	42	17.0	19.2	19.1	21.1	46
Iowa	20	3.2	6.5	6.7	6.9	26
Missouri	87	4.4	7.3	10.6	8.9	77
Arkansas	25	.....	1.1	4.3	4.8	25
North Dakota	3	1.6	1.1	0.2	0.2	5
South Dakota	2	0.5	0.6	.....	0.4	3
Nebraska	34	1.0	2.8	4.1	4.1	31
Kansas	66	6.3	6.7	14.5	5.2	67
Oklahoma	34	5.8	6.6	2.8	3.7	32
Texas	250	33.5	30.4	42.1	31.8	229
Montana	4	1.9	0.3	.....	1.0	12
Wyoming	4	0.3	0.6	0.5	1.9	4
Colorado	17	4.5	3.1	4.5	2.0	18
New Mexico	5	0.5	.....	0.5	.....	13
FAR WEST	510	66.1	118.1	92.4	115.2	693
Idaho	8	0.9	0.1	4.5	5.1	8
Utah	29	2.9	6.9	3.2	1.7	35
Arizona	6	.....	2.2	0.9	3.8	14
Nevada	2	0.3	.....	.....	.....	2
Washington	64	3.9	10.4	14.5	13.5	120
Oregon	13	2.0	2.4	5.2	4.7	49
California	387	56.1	96.1	64.0	84.4	452
Alaska	na	na	na	(a)	1.3	7
Hawaii	na	na	na	.....	0.7	5

(a) less than 0.05

ENR data

Construction in underdeveloped areas will get . . .

More Money From More Sources

The flow of public investment from economically advanced countries into construction projects in underdeveloped countries is slated to rise sharply in the next few years.

This is the result of shifts in the U. S. foreign aid program and of the establishment of new channels for financing international economic development.

Note these developments:

• President Eisenhower is asking for nearly $300 million more in foreign aid than he requested last year and roughly $1 billion more than was appropriated.

• More important, however, is the trend towards concentrating economic aid in the countries best able to use it. That means increasing stress on big, long-term development projects, usually involving a large amount of construction.

• An agreement on financing the projected $1-billion program for developing the Indus River system in India will be signed shortly. The World Bank will set up a special authority to coordinate the program, which will be financed jointly by the Bank, the U. S., Britain and Germany.

• The new International Development Association—to be a soft lending arm of the World Bank—is expected to begin operations this year or early next. This will swell the stream of capital assistance to underdeveloped countries. Initial capitalization will be $1 billion over a five-year period. Of this about $800 million will be in hard currencies. But already there is pressure to increase IDA's funds. Paul Hoffman, who piloted the Marshall Plan, last week urged that IDA's rate of lending be boosted to $1 billion a year.

• The new $1-billion Inter-American Bank will begin functioning this year. This will be the principal source of increased economic development capital for Latin America, although the World Bank and the Export-Import Bank also may step up lending there (see p. 73).

• Representatives of seven European nations and the U. S. will meet in Washington soon to coordinate economic assistance efforts in underdeveloped countries. This reflects U. S. pressure on Europe to increase its contribution to underdeveloped areas. Many European countries are now enenjoying big surpluses in their over-all balance of payments on international transactions while the U. S. continues to run a whopping deficit.

If Congress doesn't cut Eisenhower's $4.2-billion foreign aid request too deeply, key countries, such as India and Pakistan—already getting roughly 35% of the development loan fund's loans—will get an even larger slice of next year's aid pie. Both countries are launching new five-year development plans this year. U. S. aid to them probably will be from 30 to 50% greater next year. Taiwan too has come up with an integrated program of economic development and financial reform that is slated to get strong U. S. backing.

This year's aid requests, although larger than last year's, still are seen as essentially a holding operation. The State Department decided against fighting for bigger figures in an election year; and Washington wants to keep the pressure on Europe to increase its contribution to the underdeveloped countries.

But the State Department is convinced that much larger public and private investment in the underdeveloped countries will be needed in the long run.

Many officials back Mr. Hoffman's plea for an increase in total Western assistance to those areas from the present $4 billion a year to $7 billion. Of this $3-billion increase, Mr. Hoffman thinks $1 billion should be in bankable loans and private investment, $1 billion should come from IDA and $1 billion from increased bilateral and regional aid. The U. S. share of the boost would be between $800 million and $1 billion a year.

An increase this year, of course, is out of the question. Even without the increases recommended by Mr. Hoffman, the foreign aid bill is expected to run into heavier opposition in Congress than usual. A program that directly benefits no voters is not popular in an election year.

An over-all cut of $1 billion from the President's request is a distinct possibility. How much of the cut will come from funds earmarked for construction overseas is impossible to tell yet.

There has always been a hard core of opposition to foreign aid in Congress. But now there is a new element—a nagging suspicion on the part of many foreign-aid supporters that the present program is an endless repetitive process that offers no clear hope of measurable progress towards a more stable free world economy.

Many Congressmen who support the foreign-aid concept have nevertheless been increasingly critical of the program. They have been demanding a bold, new long-range formula to meet the changing economic, political conditions in the emerging nations—a new program as bold in concept as the Marshall Plan was after World War II.

New Plan for Lakes Diversion

Withdrawals from the Great Lakes would be regulated by a flexible system of international controls and supervision under a proposal made by the Indiana Great Lakes Commission.

Supreme Court decrees, the agency maintains, lack flexibility for adjustment to changing water levels of the lakes.

The varying patterns of withdrawals and inflows along the watersheds bordering the lakes and resulting changes in lake levels have never been studied in detail, according to the state commission. Such studies would be completed as the basis for a new system of controls.

The Indiana Commission states further that there are practical ways of regulating lake levels within reasonable limits. It suggests that working toward eventual construction of regulating works would be a wiser course than that of disputing specific diversions.

The dispute of the moment, in which Indiana professes neutrality, is a multisided affair pitting Chicago, which wants to divert more water, against six lakes states and Canada. In the domestic fight, Illinois represents Chicago and some suburban communities against Minnesota, Michigan, Wisconsin, Ohio, Pennsylvania and New York. Several lawsuits involving these participants have been consolidated for hearing before a special master appointed by the Supreme Court.

Canadian opposition is registered unofficially and through diplomatic channels. The U. S. government won the right last week to enter the case, and it is possible that the government's main interest is to preserve Great Lakes amity with Canada.

Canadian opposition may also be behind congressional bypassing last year of a Chicago plea for a temporary increase in water.

The answer, as the Indiana Great Lakes Commission sees it, is to have the Corps of Engineers administer all releases, with approvals to be made one or more times a year by a special commission of U. S. and Canadian members.

Odd-Looking Vehicle Goes . . .

. . . Up and Over Obstructions

An unusual cargo-carrying vehicle is being tested by engineers of Clark Equipment Co., Battle Creek, Mich. With three sets of wheels, the Swiss-made vehicle is designed to climb over ditches and rock piles, up 45 deg slopes, and even over 4-ft-high walls.

The wheels can be raised hydraulically in pairs or individually. Top over-the-highway speed is 55 mph.

Report Defends Consultant Fees

The average fees of private consultants for government work are much lower than figures widely publicized, according to a report by the National Society of Professional Engineers given at its winter meeting in Wichita.

The NSPE conclusions are based on a survey of 118 firms that had a total of 1,464 engineering contracts with 17 different government agencies and bureaus (ENR Feb. 18, p. 21).

The average design cost for the work was 2.95% of construction costs, with fees totaling $127.7 million for $4,325 million worth of construction. These fees varied from 0.5% to 14.7%.

The society's survey of 93 engineering contracts with a total construction cost of $495 million disclosed that the average fee for inspection was 2.19% of construction cost. The fees ranged from 0.5% to 7.5%.

For comparison the report cited the Hoover Commission task committee report of 1955, which said that government agency engineering costs ranged from 5.23% to 17.8%.

The NSPE report recommends that "governmental agencies should be responsible for preliminary study, preplanning and budgeting and essential supervisory management and control, with private consulting engineers handling design and other engineering services to the extent consistent with the best interests of the public."

Simple as ABC?

House unit starts work on road financing measures

The House Public Works Committee's roads subcommittee is holding three days of hearings on bills that would authorize highway aid for fiscal 1962 and 1963 on the primary, secondary and urban (ABC) systems of the federal-aid net, plus funds for national forest, park and similar roads in the same years.

Enactment of the federal-aid authorizations is essential this year if state legislatures meeting next January are to be able to approve their highway budgets for the fiscal period ahead. Two House bills—designed to maintain this customary, orderly procedure for the 50-50 systems—have been introduced.

The first, by subcommittee chairman George H. Fallon (D., Md.), calls for $925 million of federal aid to the ABC systems in each of the years, 1962 and 1963. This authorization duplicates the amount voted two years ago for fiscal 1961 and apportioned to the states last October. Under it, each state would get an annual ABC allocation equivalent to the amount received last fall (ENR Oct. 22, 1959, p. 23).

Congressman Fallon's bill makes a concession to highway financing difficulties resulting from the pay-as-you-build requirement in federal highway law. The ABC systems have first call on the Highway Trust Fund; the Interstate System has to get along with what is left. As a result, Interstate progress is undergoing a three-year slowdown.

The bill saves some money for interstate construction by holding ABC authorizations to the 1961 level—instead of an increase of $25 million per year that had become customary for ABC funds. But Mr. Fallon rejects President Eisenhower's proposal, made in his budget message, that ABC authorizations be cut to $900 million in 1962 and 1963. And he opposes the President's suggestion that the Highway Trust Fund be used to pay the cost of forest and public lands highways. Those costs are now met by direct appropriations.

The second bill, by Rep. Frank M. Clark (D., Pa.), goes along with the $25-million annual increase for ABC authorizations, setting the total at $950 million for 1962 and $975 million for 1963. Otherwise, the Clark bill corresponds with Representative Fallon's.

Both bills distribute the ABC annual authorization 45% to the primary system, 30% to the secondary and 25% to urban extensions of these systems. The two bills agree likewise in authorizing $112 million each year for roads built by the federal government.

River Project Spending May Set Record

Construction outlays account for nearly 80% of the $1.25 billion requested by the Administration for water development in fiscal 1961 by the Corps of Engineers and the Bureau of Reclamation.

The two agencies have scheduled $975 million of construction spending for the year starting July 1. This is the highest combined total in history. The Corps' share is $742 million, topping the estimate for the current record year by nearly $50 million. Reclamation's share is $233 million, up $53 million from this year's total and exceeded only twice before, in 1950 and 1951.

A big percentage of the requested money will be spent on projects listed below. The tabulation includes Corps of Engineers jobs getting $5 million or more for fiscal 1961 and Bureau of Reclamation jobs getting $2 million or more.

Only six of this year's 61 new starts appear in the list. None of the 22 other big jobs among the fiscal 1960 new starts is slated to get as much as $5 million of Corps funds or $2 million of Reclamation funds for 1961.

Conspicuously absent from the list are 10 newly started reservoirs ranging in cost from $14 million to $75 million, and a $37-million Hudson River navigation channel. These projects will require larger appropriations in later years.

Only small amounts are needed, of course, for first-year construction of 37 new starts in the 1961 budget proposed by the President. For example, appropriations of $1.5 million or less are requested to begin work on three $30-million to $40-million navigation projects and two $60-million reservoirs of the Corps of Engineers; and only $2.5 million is asked to start reclamation's $107-million Yellowtail Dam planned for Montana.

Also not listed in the table are recommended appropriations for Reclamation Bureau loans to projects that will be constructed by local districts. Congress has approved 12 such loans totaling $18 million.

House and Senate appropriations subcommittees are holding hearings on the public works money bill that includes the Corps and Reclamation requests. Congress is expected to approve funds for both agencies close to what the President has asked. But the money totals may be juggled somewhat to show dollar savings while allowing small amounts for new starts Congress may propose.

Top Civil Works Budget Requests for Fiscal '61

Corps of Engineers Projects (Over $5 million)	Fiscal Years (in millions) 1960	1961
Navigation Channels and Harbors		
Arkansas River, Ark. and Okla.	$ 4.9	$ 5.0
Sacramento River, Calif.	6.4	8.0
Missouri R., Sioux City to Omaha	5.4	5.6
Great Lakes Connecting Channels, Mich.	24.6	30.0
Delaware R., Philadelphia to Trenton	11.3	11.7
Locks and Dams		
Illinois Waterway (Calumet-Sag), Ill.	7.6	9.5
Markland Lock and Dam, Ind., Ky., Ohio	9.4	12.6
New Cumberland Locks and Dam, Ohio, W. Va.	5.3	6.4
Greenup Locks and Dam, Ky. and Ohio	9.1	10.0
Louisville Lock and Dam 41, Ky. and Ind.	10.1	9.2
New Richmond Locks and Dam, Ky. and Ohio	9.1	15.0
Pike Island Lock and Dam, Ohio and W. Va.	3.4	9.0
Flood Control Local Protection Works		
Los Angeles County Drainage Area, Calif.	15.0	13.1
Central and Southern Florida Flood Control	8.2	10.0
St. Louis, Mo.	4.1	6.2
Reservoirs		
Black Butte Reservoir, Calif.	2.3	5.9
Terminus Reservoir, Calif.	5.4	6.3
Tuttle Creek Reservoir, Kan.	17.0	16.5
Hopkinton-Everett Reservoir, N. H.	3.8	8.4
Keystone Reservoir, Okla.	10.6	17.4
Allegheny R., Reservoir, Pa. and N. Y.	1.4	5.8
Waco Reservoir, Tex.	3.9	11.0
Multiple-Purpose Projects, Including Power		
Walter F. George Lock and Dam, Ala. and Ga.	13.1	20.2
Dardanelle Lock and Dam, Ark.	4.5	6.5
Hartwell Reservoir, Ga. and S. C.	24.1	21.4
Barkley Dam, Ky. and Tenn.	16.7	17.1
Eufaula Reservoir, Okla.	11.2	20.7
Cougar Reservoir, Ore.	8.1	12.3
Hills Creek Reservoir, Ore.	8.3	10.5
John Day Lock and Dam, Ore. and Wash.	$19.5	$41.8
Big Bend Reservoir, S. D.	1.8	10.0
Oahe Reservoir, S. D.	39.6	53.5
Ice Harbor Lock and Dam, Wash.	28.0	30.0
McGee Bend Dam, Tex.	6.2	6.0
Greers Ferry Reservoir, Ark.	7.9	14.6
Mississippi River Flood Control		
Channel Improvement	22.6	22.0
Old River Control, La.	9.1	8.4
Atchafalaya Basin, La.	5.8	6.0
Bureau of Reclamation Projects (Over $2 Million)		
Gila Project, Ariz.	3.4	4.2
Boulder Canyon, Ariz.-Nev.	2.8	2.9
Central Valley, Calif.	43.5	61.3
Collbran Project, Colo.	4.5	5.1
Washoe Project, Nev.-Calif.	1.0	3.1
Washita Basin, Okla.	9.9	7.0
Crooked River, Ore.	2.8	2.2
Rogue River Basin, Talent Div., Ore.	2.7	2.4
San Angelo, Tex.	4.1	11.0
Weber Basin, Utah	5.8	8.3
Chief Joseph Dam Project, Wash.	0.4	2.0
Columbia Basin Project, Wash.	7.8	6.1
Missouri Basin, East Bench Unit, Mont.	0.5	2.8
Missouri Basin, Farwell Unit, Neb.	3.0	7.7
Missouri Basin, Frenchman-Cambridge Div., Neb.	4.1	5.4
Missouri Basin, Yellowtail Unit, Mont.	0.0	2.5
Flaming Gorge, Utah	11.7	18.4
Glen Canyon, Ariz.	27.1	12.1
Central Utah, Vernal Unit, Utah	2.4	2.2
Seedskadee Project, Wyo.	1.8	4.0

It will be years before this mile-long, double-decked highway and railroad bridge has to be repainted. Every coat of the maintenance paint now being applied contains *M50* pigment.

Maine triple protects big Kennebec bridge with 3-deep, *M50*®"Defense-in-Depth" paint system

Did you know that you can now buy metal protective paints with anti-corrosion pigment in *all three coats* . . . primer, intermediate *and* finish?

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A relatively new pigment, *M50*® *basic lead silico chromate,* permitted development of these outstanding new-type metal protective paints.

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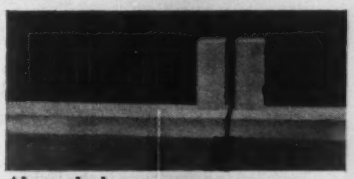
In October, 1956, Maine painted a small highway bridge in Minot's Corner with *M50* "Defense-in-Depth" paints. Small photos show you how that paint job looked in August, 1959.

Now Maine is giving its mile-long double-decked, Kennebec Bridge in Bath the same *M50* pigment 3-deep protection. Old surface is brush blasted then given an *M50* spot prime and an *M50* intermediate coat where needed. Final step is the application of 2600 gallons of an *M50* green finish coat.

As Maine goes...

. . . so goes the nation. State after state is completing its early tests of *M50* "Defense-in-Depth" paints and has big *M50* bridge maintenance painting jobs under contract or advertised for bids . . . Georgia, Missouri, New York, South Carolina. And many more to follow suit.

Your regular paint suppliers can make *M50* "Defense-in-Depth" paints. Ask them. For technical details on *M50* pigment itself in metal protective paints, write National Lead Company.



Above decks . . .

Below decks . . . First Maine bridge to be painted with *M50* "Defense-in-Depth" paints remains free of film defects. Bridge, at Minot's Corner, was painted 34 months before pictures were taken.

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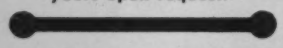

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Maryland Getting Billboard Bonus?

Maryland may become the first state to take advantage of no-billboard provisions of federal-aid highway legislation.

Maryland highway officials filed a formal request with the Bureau of Public Roads earlier this month for the extra ½% no-billboard bonus agreement.

The Bureau is in the process of deciding on the matter now and chances are good the okay will come by the end of next week.

This will then be the first such agreement to be signed with a state. Other states—Virginia, Oregon, and Wisconsin—have had informal talks with BPR on the matter. And virtually all states have some activity going on the issue. It requires a tightening up of state laws in most cases, a BPR spokesman says.

Since the Maryland agreement will be the first of its kind, the bureau plans to have the Secretary of Commerce okay and sign it. Future agreements, however, will probably be handled by Highway Administrator Bertram D. Tallamy.

Money to pay the states the ½% bonus won't come out of the Highway Trust Fund. Congress is supposed to appropriate it from general funds. In the future BPR will probably include bonus money requests in its annual budget.

States will be paid on a project basis. When a project is approved in a state with a no-billboard agreement, an extra half-percent will be added to its federal-aid money. Total cost for the program if all states were to get agreements has been estimated at $100 million.

Around the Country . . .

• **Missouri River study**—The Corps of Engineers has begun studying a slack-water navigation system for the Missouri River. Purpose of the investigation is to determine whether a stair-step series of low dams with locks would be better than the present open-river system, in which navigational depth is maintained by releases from the big dams in the Dakotas.

• **Gassing up**—A $45.1-million expansion program has been announced by Trunkline Gas Co., a subsidiary of Panhandle Eastern Pipe Line Co. The planned work will complete the looping of the company's pipeline between Longville, La. and Tuscola, Ill. It will involve construction of 252 miles of main line and 140 miles of lateral supply lines.

• **Chicago center coming**—Watch for appointment of architects to design a $67-million civic center for Chicago. The project calls for two 21-story city and county government buildings.

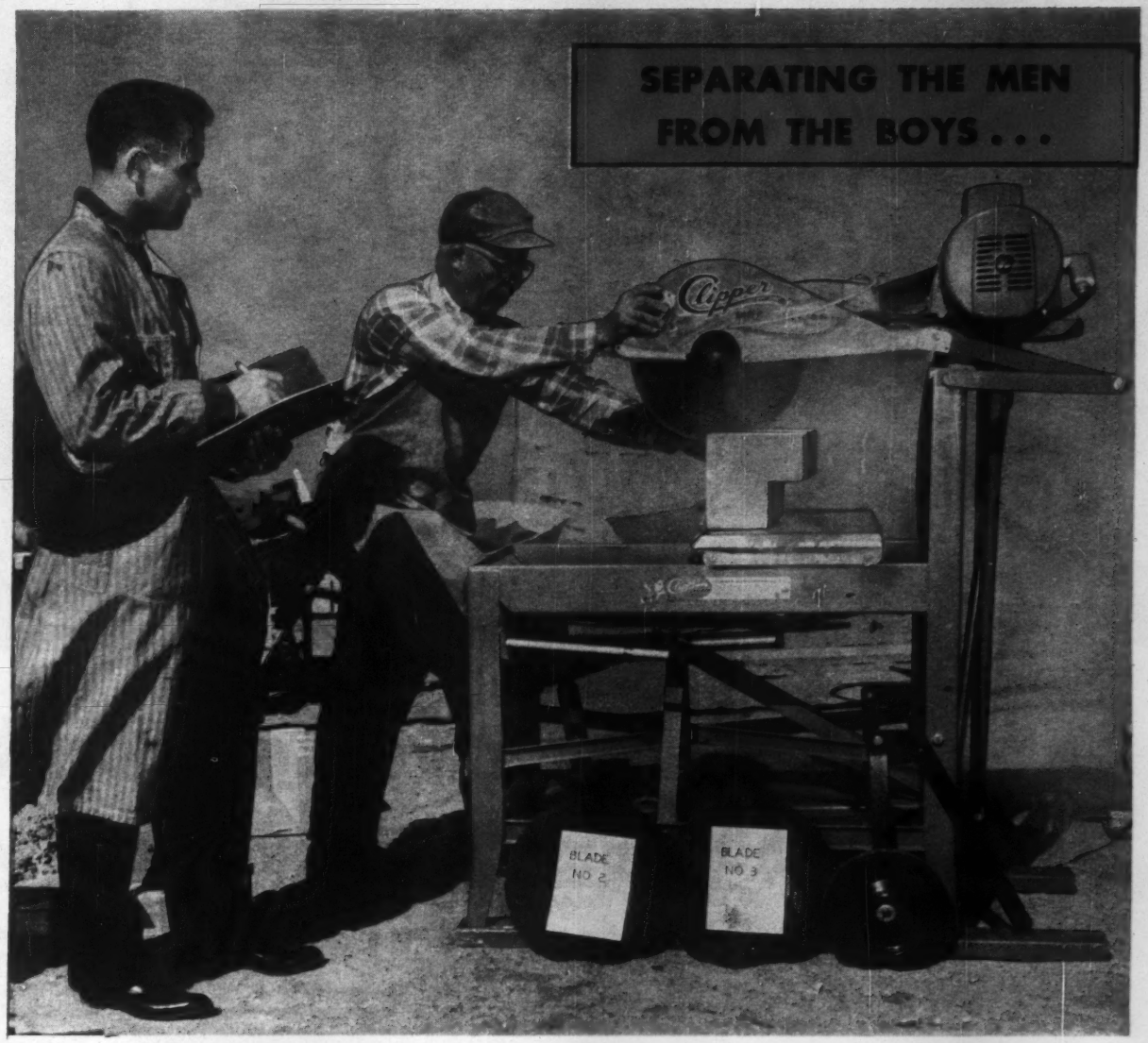
• **City to double water supply**—The City Council of St. Petersburg, Fla., is expected to commission the Chicago engineering firm of Greeley and Hansen to begin planning a $15-million water supply expansion program that would about double the present capacity of the city's water supply system.

• **Pollution laggards**—The Ohio Water Pollution Control Board is putting the heat on municipalities still discharging raw sewage into the state's streams. Youngstown was denied a 60-day extension for complying with the board's pollution control ultimatum. Only 28 of the state's 86 communities still dumping raw sewage into open water are building treatment plants. Six cities are in the process of starting construction.

• **Peering ahead on piers**—Up for approval by New York City's Board of Estimate is a long-range survey to aid pier development on the Hudson River from 1960 to 2000. Cost of the proposed survey is expected to be $315,000 and will be done by Ebasco Services, Inc.; Moran, Proctor, Mueser & Rutledge, consulting engineers; and Eggers & Higgins, architects.

• **Just around the corner**—By 1976, there will be 114 million registered vehicles, which will travel 1.2 trillion miles that year and consume 97 billion gal of fuel. These are new estimates made by BPR; 1959 registration was about 70 million vehicles.

• **Bid for high towers**—Low bidder on the Brooklyn and Staten Island towers of New York's Narrows Bridge was Bethlehem Steel Co. at $46,919,500.



● In most every field a boy is often sent to do a man's job because it costs a little less at first. In every case, experience and stamina are finally needed to get the job done faster — and at lower cost.

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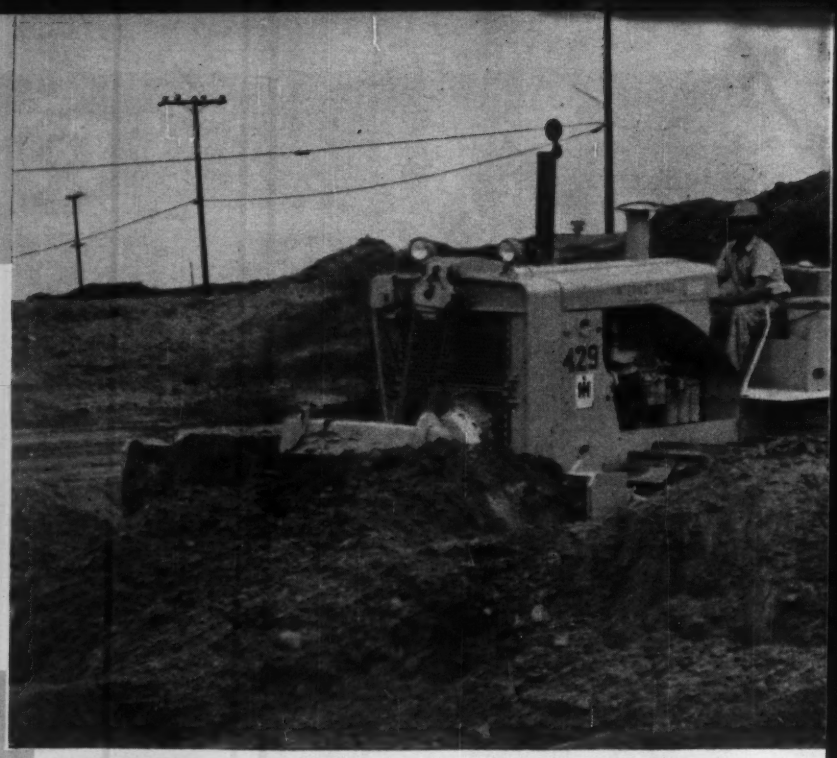
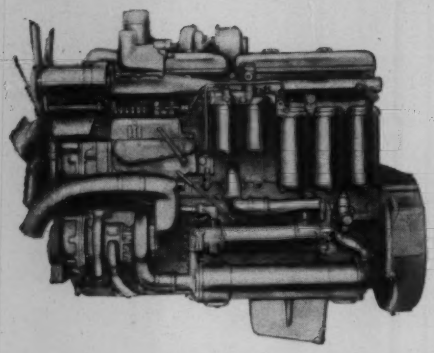
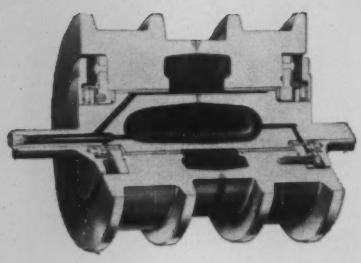
Mr. Clipper

Three new International TD-25's of contractor V. E. Posey's fleet team up preparing home sites from a mountainside...near San Diego, California. One "25" operator comments: "The power is there, but big engine 'sound and fury' are just about gone!"





Big power "plus" of the new TD-25 is the new direct-start, 6-cylinder turbocharged International DT-817 diesel engine. Tri-metal crankshaft bearings; valve rotators; dry-type air cleaner; externally-mounted, gear-driven oil and water pumps—all are typical DT-817 long-life, high-output features!



How you get full-

Thick-shelled International Dura-Rollers have king-sized lube reservoirs, positive sealing, and exclusive relief-passage protection from over-lubrication. These *minimum maintenance* track rollers give you practical 1,000-hour lubrication intervals!

Keep full loads on the move full time with exclusive Planet Power-steering. Full power on both tracks, full time, is the answer! And Hi-Lo on-the-go power-shifting lets you match power to condition, instantly, to keep loads "on the move"—and increase speed where practical! This "25" belongs to Berke Moore Co., Inc., Boston expressway contractor!

load turns...full-speed cycles

with proved TD-25 standard equipment!

As standard equipment at no extra cost, the new 230-hp TD-25 gives you the International® proved control combination that has been outproducing king-sized clutch-steered crawlers for years!

You get combined Planet Power-steering and Hi-Lo on-the-go, power-shifting exclusively in the new International TD-25. And you get this basic, built-in design advantage in your choice of torque-converter or synchromesh model!

With this and all its other big advantages, the TD-25 can outearn other big rigs up to 50%—on push-loading, bulldozing, or pulling big drawbar tools such as a shale-shattering ripper!

No "dead-track drag" or "gear-shift lag"!

Planet Power-steering gives you full-time "live" power and traction on both tracks, to make full-load turns—and to eliminate load-limiting "dead-track drag." And Hi-Lo on-the-go power-shifting instantly matches power to conditions to end load-losing "gear-shift lag."

Hi-Lo power-shifting makes the TD-25 the industry's only king-sized 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. In the synchromesh transmission "25," the Hi-Lo planetary system gives eight speeds forward and reverse. Either model gives you cycle-speeding, up-or-down, on-the-go power-shifting with "finger-tip" ease!

Power-shift and power-steer the new "25" with king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outearn clutch-steered king-sized crawlers, up to 50%—and with standard control equipment! Compare simplified TD-25 design—the only planetary system engineered and located to give you "live track" power steering and on-the-go, up-or-down power shifting! See your International Construction Equipment Distributor for a demonstration!

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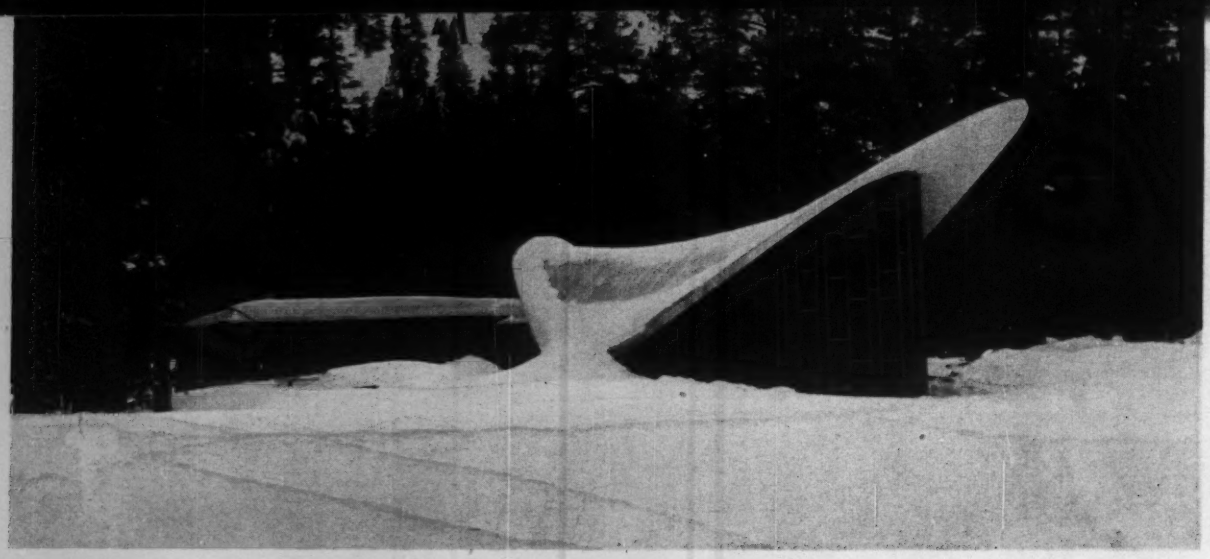

The athletes are gone, but this chapel remains as . . .

Squaw Valley's Olympic Keepsake

A striking interdenominational church is one of several buildings remaining in Squaw Valley, Calif., as a permanent reminder of the 1960 Winter Olympics.

The church's chapel structure consists of three entirely independent structural parts:

- A saddle-shaped thin-shell roof supported by two buttresses on steel pile foundations connected by a tie beam.
- A stained-glass window wall, whose mullions are supported at the base by an independent foundation and have a slotted connection to the shell roof at the top.
- A floor system of post and beam wood construction. It's on concrete foundations independent of both the roof and mullions.

The roof tip rises about 30 ft above the springing line at the altar end of the chapel and about 20 ft at the entrance end. The roof is 36 ft wide between buttresses. Its length in plan is 78 ft—26 ft from buttress line to entrance and 52 ft from buttress line to the altar tip. This unequal division contributes to the strike effect of the building.

Unlike most saddle forms, the boundary of the chapel is curved, not straight. The curves are plane parabolas that intersect at the points of support.

Also unlike similar forms, the shell is not a hyperbolic paraboloid, but a free form surface defined by a more complicated mathematical formula.

The thickness of the shell is about 2½ in., gradually increasing toward the edge zones. There is no edge beam in the usual sense. Along the edge of the shell, thickness increases toward the buttresses. To provide a smooth transfer of stresses from the shell into the supports, the engineers molded the buttresses. A deliberate effort was made to reflect the flow of the the stresses in the structure in the shape of the shell and the buttresses.

Local code required that the shell roof be able to carry additional loads. Besides its own weight it had to support a snow load of the intensity of 120 psf on flat horizontal surface. This load could act on only one or both sides of the roof. The roof also had to support lateral loads due to wind or earthquake.

Time limitation made it unfeasible to formulate a bending theory for the complex shape. Consequently, engineers formulated the problem in terms of a quasi-membrane theory, which, in addition to the membrane state of stress, included the most important bending effects. It was found that stresses were numerically small and that the assumed 2½-in. thickness of the shell was sufficient.

Reinforcing was calculated on the basis of the usual assumption that the shell acts like homogenous elastic material. Reinforcing bars in areas of 2½-in. thickness were placed in three layers. These were, starting from the top: transverse reinforcing (No. 4 at 6 in.) longitudinal reinforcing (No. 3 at 6 in.) and diagonal reinforcing (No. 4 at 6 in.). Additional reinforcing was placed in high stress zones at the boundaries and at the top of the shell. Special bars transferred unbalanced loads into the buttresses.

Deflection calculations ensured that no load be transferred vertically from the shell into the window wall mullions. (The window wall mullions are capable only of transmitting lateral loads.) The slotted mullion-to-shell connection provided also for the possibility of upward motion of the shell as a result of changes in temperature.

Pile foundations reduced the danger of large rigid body motions of the shell, which could be dangerously magnified by the shell's geometry.

The problem of local instability of the edges, which act primarily in compression, was handled by increasing the shell's thickness at the perimeter.

Shell concrete went on in this sequence: The first day, the areas immediately above the buttresses, and an 8-ft-wide strip along the top of the shell were poured.

The following day an additional strip of the shell was placed on each side of the previously pneumatically placed top band. The narrow width of the shell above the buttresses was poured on the final day.

This sequence of placing concrete was used so that the forms might settle without any of the load being transferred into the buttresses before the concrete attained sufficient strength.

The shell concrete was cured by covering with burlap, which was kept moist for a period of seven days. Provision was made for heating the shell roof in case of a sudden drop of temperature.

Shell finishing consisted of spraying three coats of white rubber sealant, having a total thickness of 26 mils. The edges and soffit were made smooth with cement mortar. A copper stop was provided on the edge of the shell.

Designers were Lipscomb, Killam and Whitaker of Berkeley, Calif. Stefan J. Medwadoski of San Francisco was the structural engineer. The William Horstmeyer Co. of San Francisco was the general contractor.

"the greatest ocean pipelaying job in construction history"*

In December 1959, the last section of pipe for the 7-mile Hyperion sewer outfall at Los Angeles, Calif. was laid in 200 ft. of water by Hyperion Constructors, a joint venture of six construction firms — Raymond International, Inc., DeLong Corp., Healy-Tibbetts Construction Co., Peter Kiewit Sons' Co., Macco Corp., and Tavares Construction Co.

The self-elevating, mobile work platform, developed by DeLong, was the key to the success of this unique project. The pipelaying operation began by floating the 4,500-ton platform into position and jacking it up on its legs to a working height safely above water level. A 192 ft. string of concrete pipe, weighing 720 tons, was floated into position slung beneath a 212 ft. pontoon. Pulled under the platform, lowered to the bottom and joined to pipe already in position, each 14 ft. diameter section was ballasted in place by 1200 tons of gravel, spread in sixty minutes by a moving tremie pipe. The entire line was placed by the mobile platform from some 170 work positions. The speed and ease with which the DeLong platform was moved from one position to another contributed to the early completion of the Hyperion sewer outfall — biggest ocean pipelaying job ever attempted.

In addition to work platforms, DeLong also designs and builds mobile offshore drilling platforms, piers, wharves and other structures. Write us about your special requirements or request a copy of our new, 24-page brochure describing and illustrating the patented DeLong Jack and projects recently completed.

*ENGINEERING NEWS-RECORD, *July 2, 1959*

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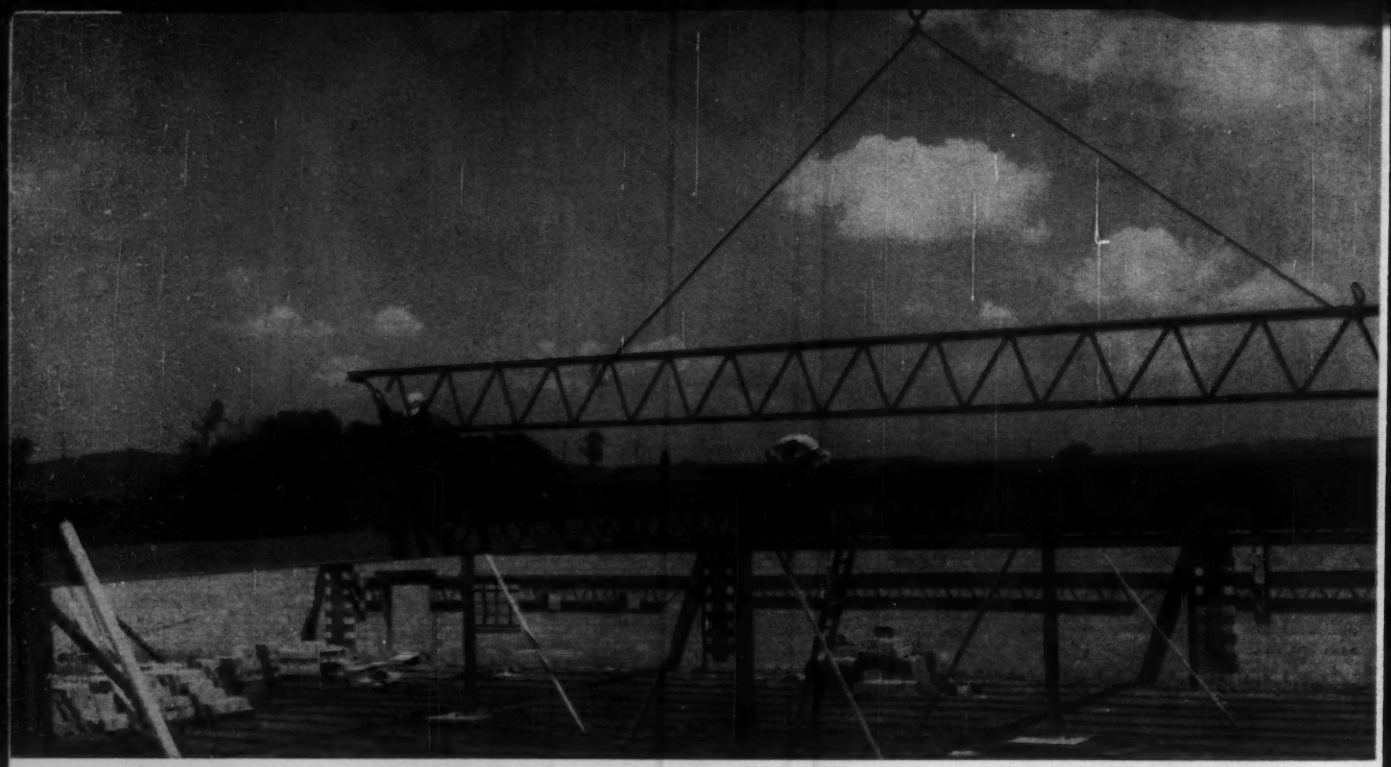

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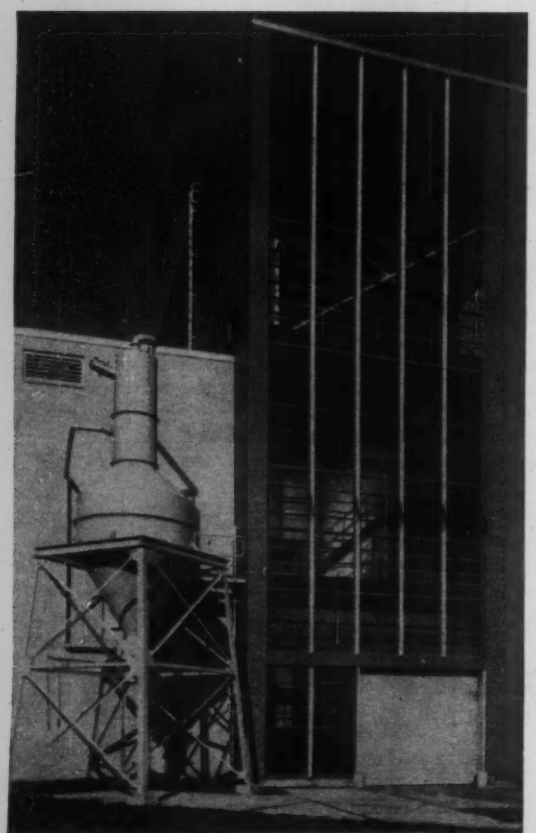

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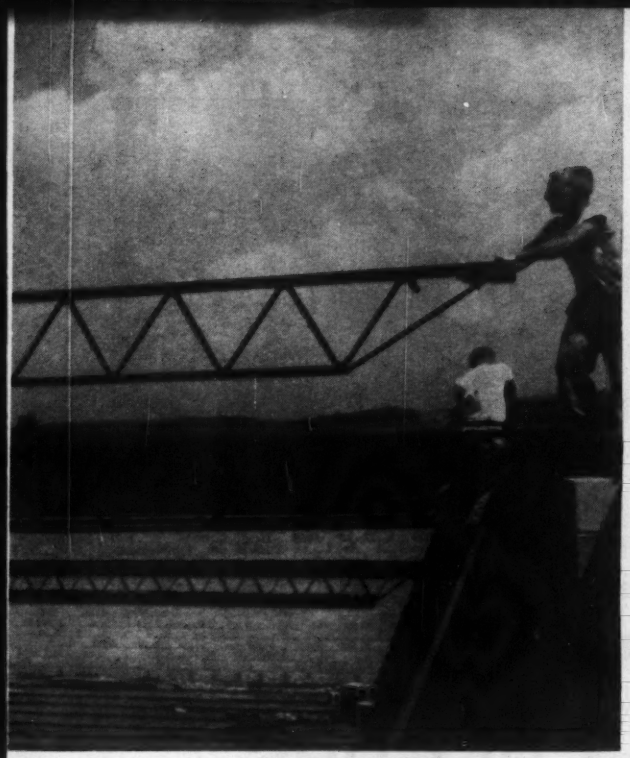
Include Truscon "O-T" Steel Joist in your next set of plans. Send coupon for specifications and data.

TRUSCON VISION-VENT® Window Walls with Truscon Intermediate Projected Type Windows and Screens were used in the construction of the West Hartford Incinerator, West Hartford, Conn. Architects: Metcalf & Eddy, Boston, Mass. Contractors: Associated Construction Company, Hartford, Conn.



TRUSCON "O-T" STEEL JOIST was used in this construction, Attle W. Wampler & Sons Furniture Store, Baltimore, Md. E. S. Armacost & Son were the builders and designers. Truscon Wire Fabric, Bars, Structural Steel, Steeldeck, Series 57 Doors, Commercial Projected and Security Steel Windows, are other Truscon products that have been specified for the job.

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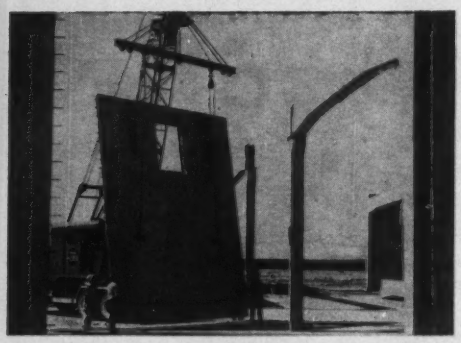

SUPERIOR Stress Equalizers, Pick-Up Inserts, and Lifting Angles were used on this panel.

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ADJUSTABLE BRACES used for quick and easy alignment of panels

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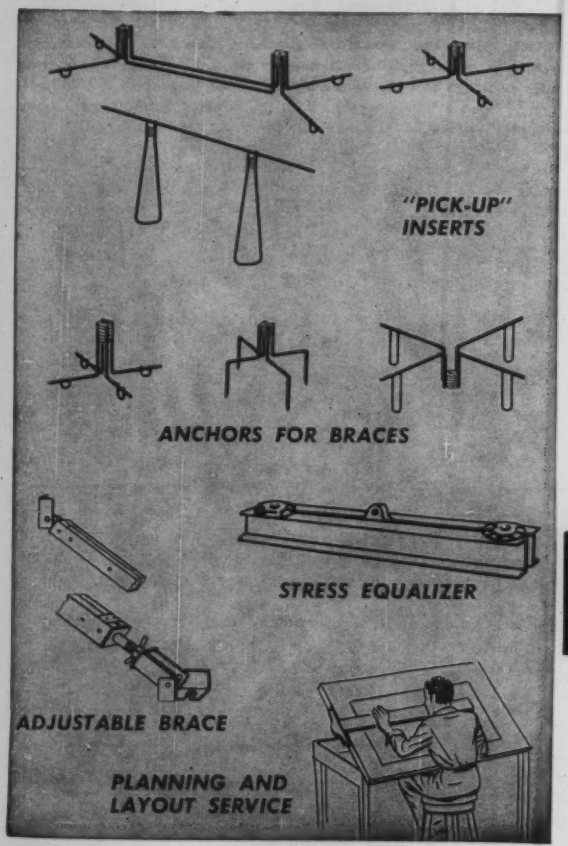

In addition to tilt-up accessories which have been used and proven on thousands of conventional as well as unusual projects in this field, SUPERIOR also provides the *system* for the entire job, from original planning and layouts, to the final positioning of the precast panels.

As the pioneer in this field, SUPERIOR has recently developed a special Stress Equalizer for reducing lifting stress in tilt-up panels of over 20 ft. high. It offers two advantages: (1) Less concrete reinforcing steel is required for stresses which occur at time of lift; (2) Permits use of simplified crane rigging.

On your next tilt-up job, avoid expensive crane delays, be assured of safety, and reduce overall costs! Specify the SUPERIOR System.

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Toronto's Cover-Then-Cut Subway

An upside-down "cover-then-cut" tunneling procedure has been tested—apparently with success—on an initial section of the Bloor Street Subway in Toronto, Ont.

The unusual procedure is the so-called Milan method of tunnel construction. Reinforced concrete tunnel walls are cast in unsheeted trenches filled with a bentonite slurry; a roof is cast on unexcavated earth between the walls; and the tunnel is excavated as one of the final operations.

The Milan method, which takes its name from the Italian city in which it was first used 10 years ago, was tried in Toronto for several reasons:

The city is congested, so construction methods that minimize traffic dislocation are desirable.

Much of the subway is to be installed through residential, hospital and school zones, so "quiet" construction is essential for public comfort and the establishment of good public relations.

Lastly, but equally important, the Toronto Transit Commission and Metropolitan Toronto, partners in the project, were looking for fast, economical and sound construction procedures.

The bentonite process has its limitations and its disadvantages, but on the experimental section of the Toronto Subway, it appears to have met every test.

- The independent construction of opposing walls limits the space needed for working area, and the use of slurry rather than sheetpiling or soldier beams for support of the walls eliminates the noisy pile driving operation.
- According to transit commission engineers, completion time for the work was better than expected. The cost of the test section was below the estimate and indicates that the method can compete cost-wise with conventional tunneling methods.

Official reaction to the 177-ft-long test section has not yet been made public, but unofficial opinions indicate further use of the Milan method in construction of the remainder of the $200-million, 10-mile subway.

Bentonite has long been used in oil drilling. The process by which it is used in tunneling was developed in 1950 by Christian Veder, a director of Impresa Costruzioni Opera Specializzate of Milan. ICOS, constructor of the Milan subway and owner of patents on equipment used in its method, is doing the test work in Toronto through a Canadian affiliate, Icanda Limited.

Bentonite is a soft, porous, clayey rock that is highly absorbent. When powdered, it can be put in water and kept in suspension for long periods of time. The resulting slurry has a specific gravity in excess of 1.

SUBWAY WALLS are in although tunnel excavation has not yet begun.

The slurry does several things when placed in an earth cut. Its weight prevents groundwater from entering the cut. It coats the walls of the cut with an impervious plastic film that prevents the water in the slurry from leeching outward. To a certain extent, it smooths the walls by filling voids.

The amount of bentonite in a slurry can vary from 4% by volume (as in Toronto) to 18% depending on job conditions. The slurry can be reused repeatedly because normally the bentonite loss is negligible. At Toronto a total of 688 lin ft of trench walls, varying in depth from 24 to 54 ft, was held with only 25 tons of the material.

(For more about how bentonite can be used see ENR Feb. 11, p. 42.)

Here's how Icanda Ltd. did its job:

A 5-ft deep trench was dug on structure alignment and its walls were concreted to guide the digging bucket.

The trench was dug between the guide walls in a series of holes. Each hole was about 6 ft wide (the width of the open clamshell) and each was separated from adjacent hole by a 2 ft wide column of unexcavated earth. These columns were later removed by a second machine. The intermittent excavation assured longitudinal bucket alignment. At all times the excavations were kept filled with slurry.

With 16 to 20 ft of trench cut, a 20-in. dia pipe was inserted vertically at each end to serve as a concrete stop and to form a key. Reinforcing was then lowered to the proper depth and concrete tremied in. Bentonite slurry displaced by concrete flowed through the guide trench into holes dug ahead.

The top of wall was purposely cast to an elevation 2 ft above plan elevation so that any separated materials could be removed before placement of the roof.

The ground between the walls was excavated to a depth 3 in. below the underside of the roof to be built. A 3 in. thick "smoothing" slab of concrete was cast on the ground and heavily waterproofed to prevent a bond between it and the 2-ft thick roof slab that was cast directly on it.

When the roof concrete had set sufficiently, a front-end loader removed the earth from within the three sided box formed by the walls and roof. Excavation included removal of the 3-in. smoothing slab under the roof.

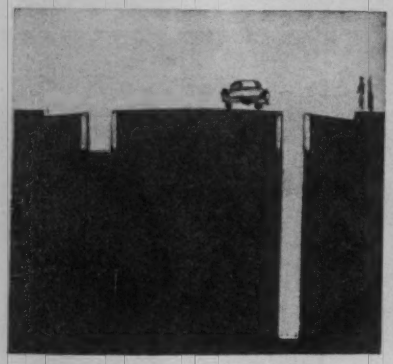
The floor, box curbs and footings for the center columns were then cast. The center columns were cast through holes left in the roof for this purpose.

The east-west Bloor Street Subway will be Toronto's second transit tube. It will connect in a loop with the north-south Yonge Street Subway, which up to now has been Canada's only subway. It was built between 1949 and 1953 at a cost of $55 million. Its 4½ mile length was installed by standard cut-and-cover and open cut construction. While both these methods will be used on the Bloor Street tube, as well as conventional tunneling procedures, it is expected that the Milan method will also have its place.

I. V. Galbiati, a young Milanese with degrees from the University of Milan, in Italy, and McGill University, in Montreal, is project manager for Icanda. W. H. Patterson is chief engineer for the commission. The project manager on the test section is Patrick Wiley.

For a picture report on the method, turn the page

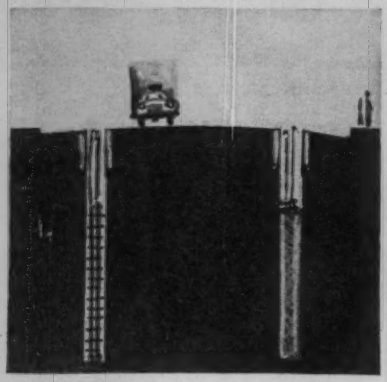
. . . Here's how the Milan method works (*Story starts on p. 37*)



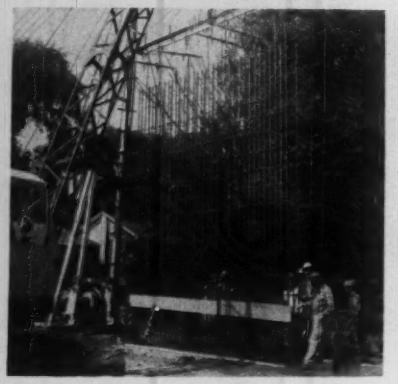
Excavating wall trenches ▸

Trench is dug on the wall line.

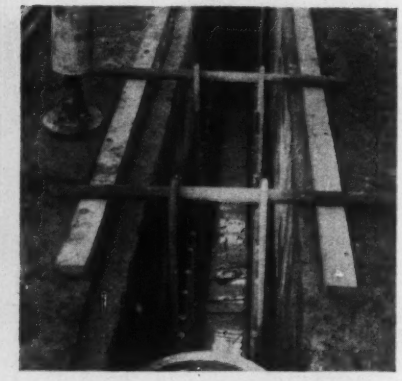
Guide walls are formed and cast.



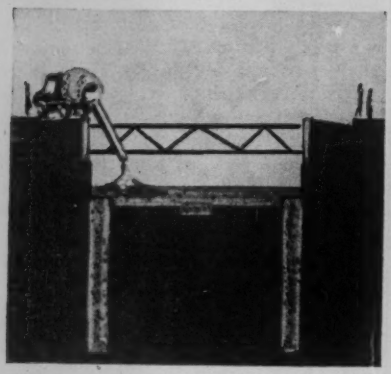
Concreting of side walls ▸



Steel cage is lowered into trench.

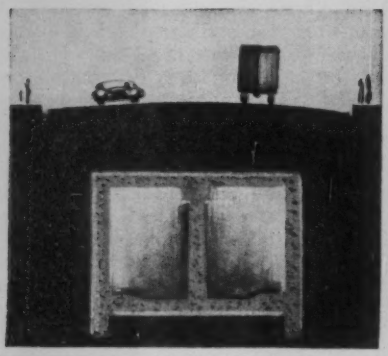


Bars hang in slurry-filled trench.

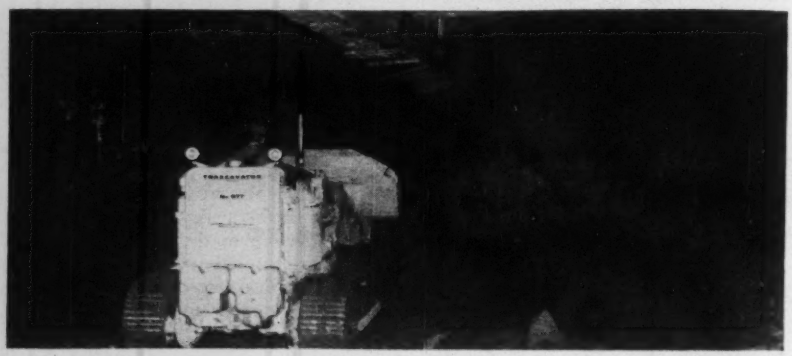


Placing the roof slab ▸

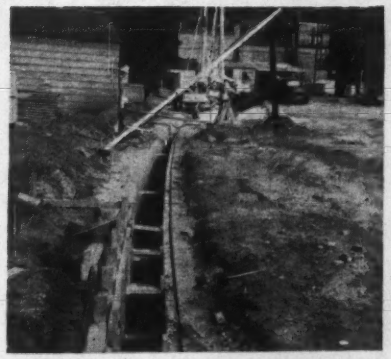
Backhoe cuts earth between walls to the depth of roof subgrade.



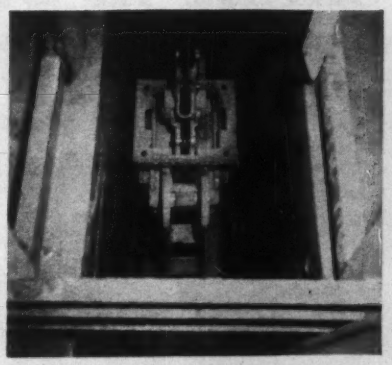
Completing the tunnel ▸



Excavator cuts earth in covered tunnel to floor subgrade.



Equipment is set up astride trench.



Bucket digs in bentonite mixture.

Spoil is chuted into skips.

Subway wall is cast of tremie concrete.

Concrete surcharge is removed from wall.

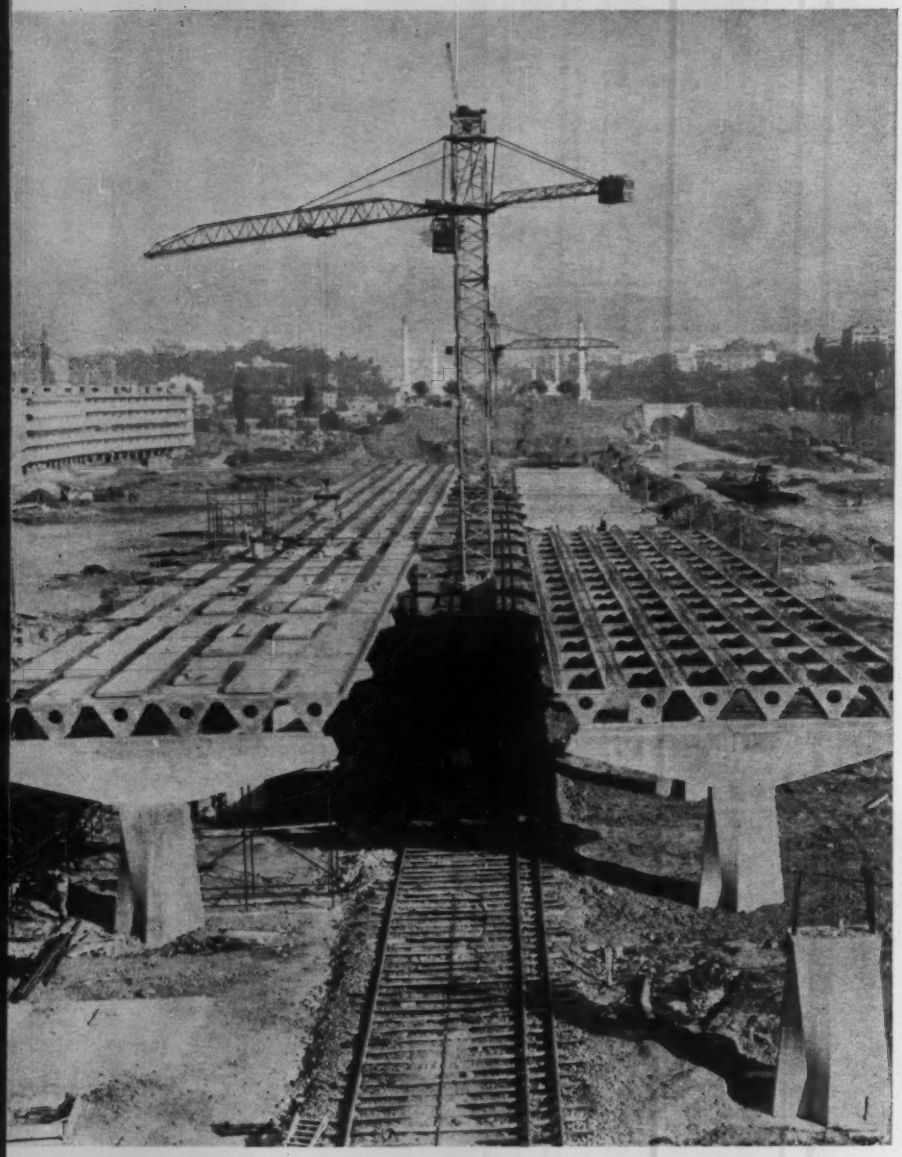
Cut is prepared for casting 3-in. roof forming slab.

Reinforced concrete roof is cast on slab to span walls.

Floor reinforcing steel is placed at proper elevation.

Casting of floor and columns completes the tunnel.

Novel Prestressed Beams Go Into



Twin elevated structures will serve next summer's games site.

Now that the winter Olympic games are over at Squaw Valley, Roman builders are rushing to complete a novel viaduct that will connect Rome's Flaminio Bridge with the site of the summer Olympics.

The highway, a 3,000-ft elevated route, is a combination of hollow prestressed concrete beams, precast concrete elements and cast-in-place concrete.

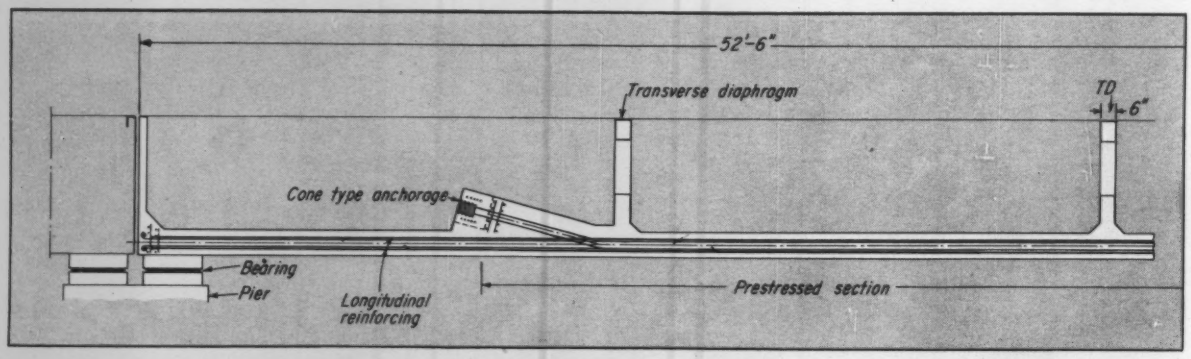
The viaduct, called the Corso Francio, incorporates two separate, elevated structures, one for traffic in each direction. Each structure will carry three lanes of traffic and a pedestrian path. The height of structure from the ground varies from 23 ft to nearly 38 ft.

Hollow triangular prestressed concrete beams used as main load-carrying members are about 52 ft 6 in. in length; their top width is about 6 ft 4 in.; bottom width is 1 ft 4 in.; and overall depth is about 3 ft 8 in. Each beam is cast with three intermediate transverse diaphragms, 6 in. wide and about 13 ft c-c. The intermediate diaphragms, as well as the transverse sections at either end of the beam, are cast with a circular opening about 1 ft 6 in. in diameter.

The central section of the lower flange of each beam is prestressed by a system involving the use of parallel-wire cables and cone-type anchorages. Prestressed length of each beam is about 35 ft. Prestressing is done on the site with two parallel cables anchored in the beam interior about 9 ft from the beam ends. Each cable is made up of 12 ¼-in. wires.

The central section of lower flange also contains 12 1-in. dia reinforcing bars arranged in two parallel rows. As the distance from the center of the beam increases, these bars are cut off at various points.

Stirrups and additional longitudinal reinforcing are provided in the triangular legs of the beam. Dowels were left protruding to tie the prestressed beams



Parallel-wire cables and cone-type anchorages are used to prestress beam lower flange . . .

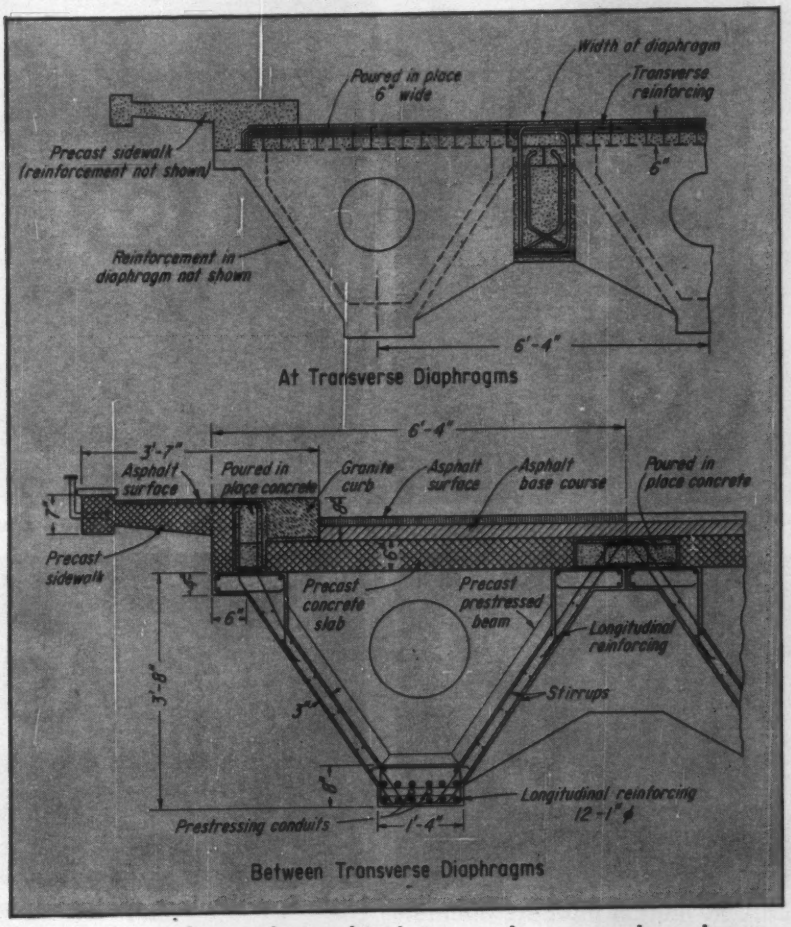
Olympic Road in Rome

to precast slabs that cover the open tops of the triangular beams between diaphragms. These slabs form a portion of the bridge deck.

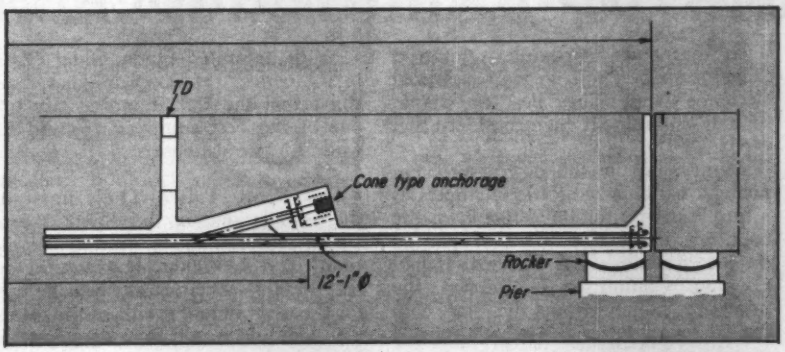
Each roadway is six beams wide. The prestressed beams, precast slabs and precast sidewalks are tied together by cast-in-place concrete.

Foundation piers have an unusual appearance, because of a novel "twist" effect and because they are larger in cross section at the bottom than at the top.

Pier Luigi Norvi designed the structure. The Roman construction firm of Nervi & Bartoli is building it under the supervision of Italy's Ministry of Public Works.



Cross sections show relationship between beams and roadway.



. . . that also carries several longitudinal reinforcing bars.

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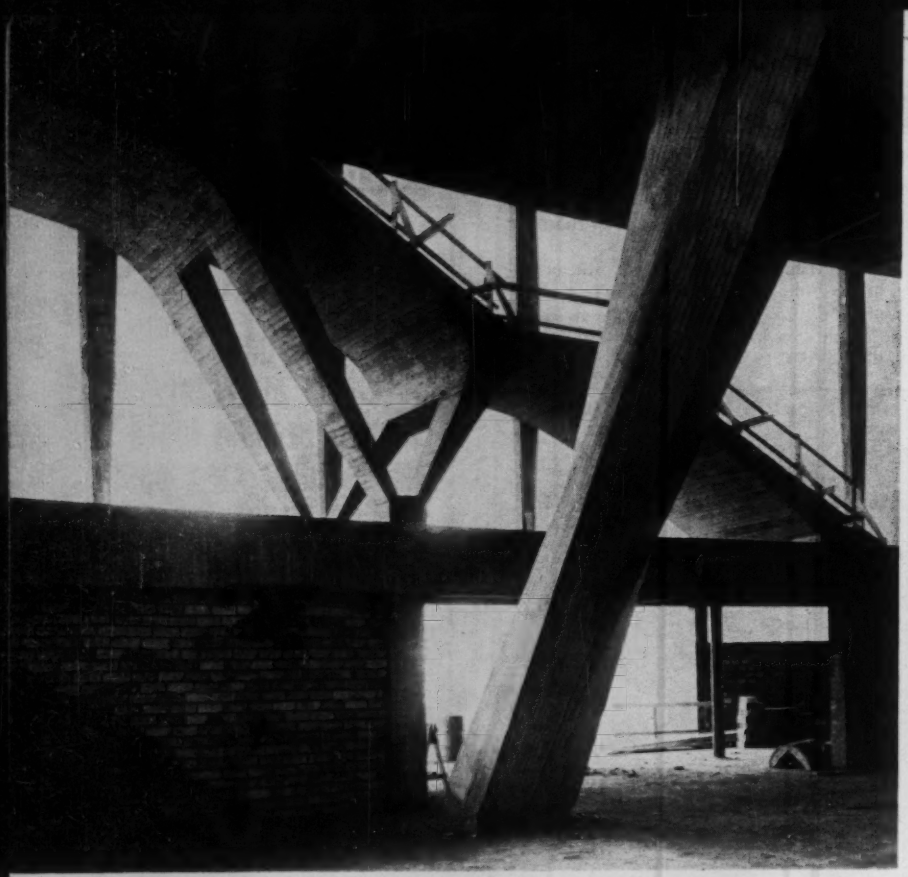
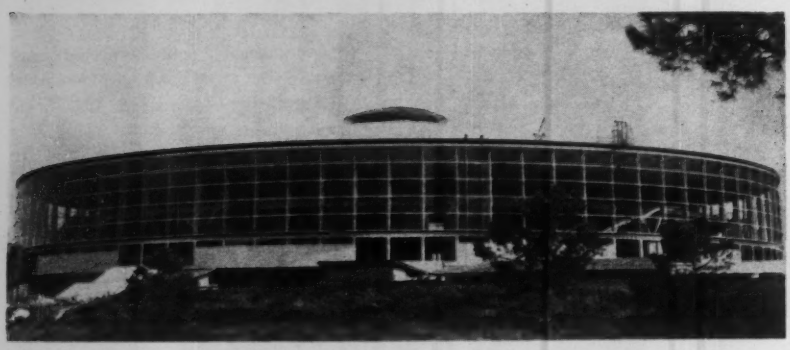
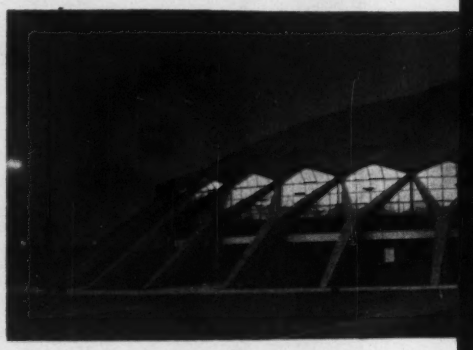


ODD SHAPES: "Braided" pillars support Sport Palace dome.

Y-shaped bents carry shell dome



MAJOR STRUCTURES: Sport Palace is 400-ft-dia saucer shape.



Little Sport Palace features precast

Complex Concrete Shapes Set

Against a backdrop of ancient ruins and Renaissance settings, today's Romans are constructing the most elaborate stage ever set for the Olympic games.

At a cost of nearly $29 million, the City of Rome is building 15 stadiums that will seat more than 200,000 fans at one time this summer. In addition, a $10.5-million Olympic village will house the thousands of athletes coming from 76 nations.

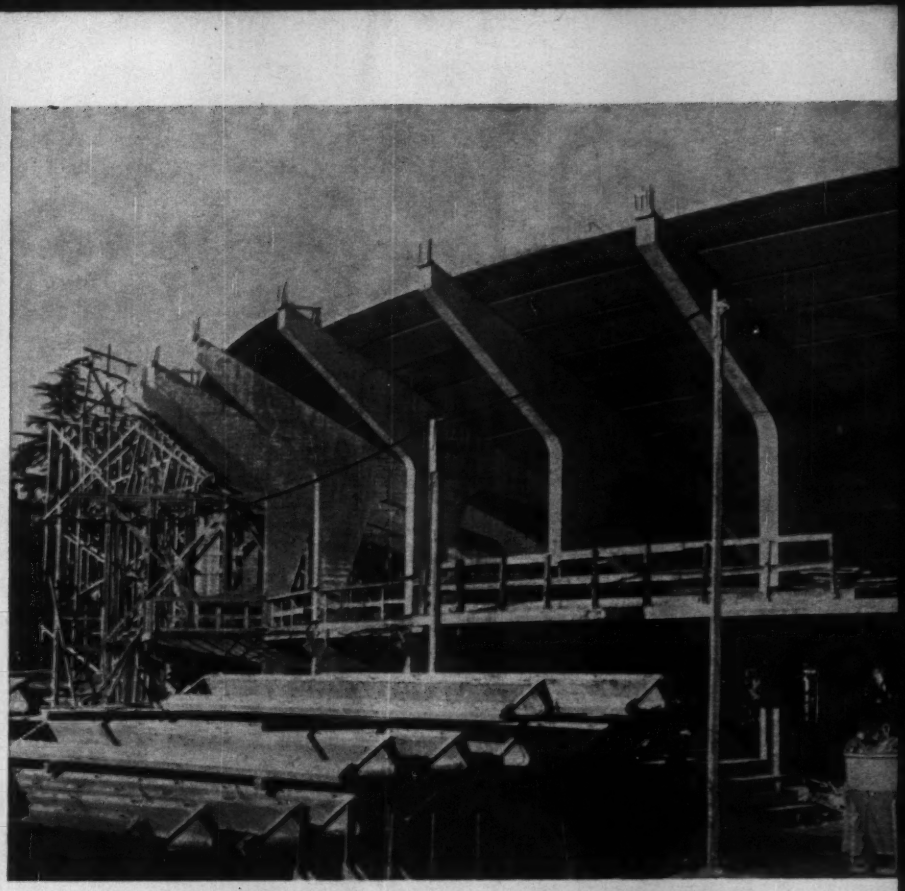
The giant structures bear little resemblance to conventional sports arenas. They are marked by complex reinforced concrete shapes, vast areas of glass and sweeping lines. They bear the stamp of Italy's prominent engineer, Pier Luigi Nervi.

Money, usually the biggest problem facing a nation staging the Olympics, is a simple matter for Italy, thanks to the country's national pastime of betting on soccer games. The National Italian Olympic Committee has drawn the necessary money from the state-controlled soccer lottery, in which Italians spend nearly $2 million a week.

With unlimited funds, Chief Olympic Engineer Mario Saini has been converting the Italian capital city into one of the best equipped areas in the world for popular sports.

• **The Sport Palace**—The largest of the installations is the Sport Palace, whose saucer shape is nearing completion. The 123,000-sq-ft structure can seat 15,000 spectators and will be used for the main indoor events of the games. The building is 400 ft in diameter and 106 ft high.

of Little Sport Palace.



Precast triangular sections form seats for Flaminio Stadium.

dome 4¾ in. thick.

Flaminio Stadium is built of 7,652 precast sections.

Stage for Rome's Olympic Games

The designers of the structure, engineer Nervi and architect Marcello Piacentini, aimed for lightness and ease of erection. They developed a 328 ft dia dome made of 1¼ in. thick precast concrete units, grouted together in place.

The dome rests on 48 "braided" precast concrete supports that also support the gallery and service areas beneath. The 96, outside facade pillars, 133 ft high, also are concrete. The dome's sections are curved in cross section, providing channels for air conditioning.

The arena itself has a diameter of 147 ft. Spectator seats are precast sections that rest upon poured-in-place reinforced concrete diametric beams.

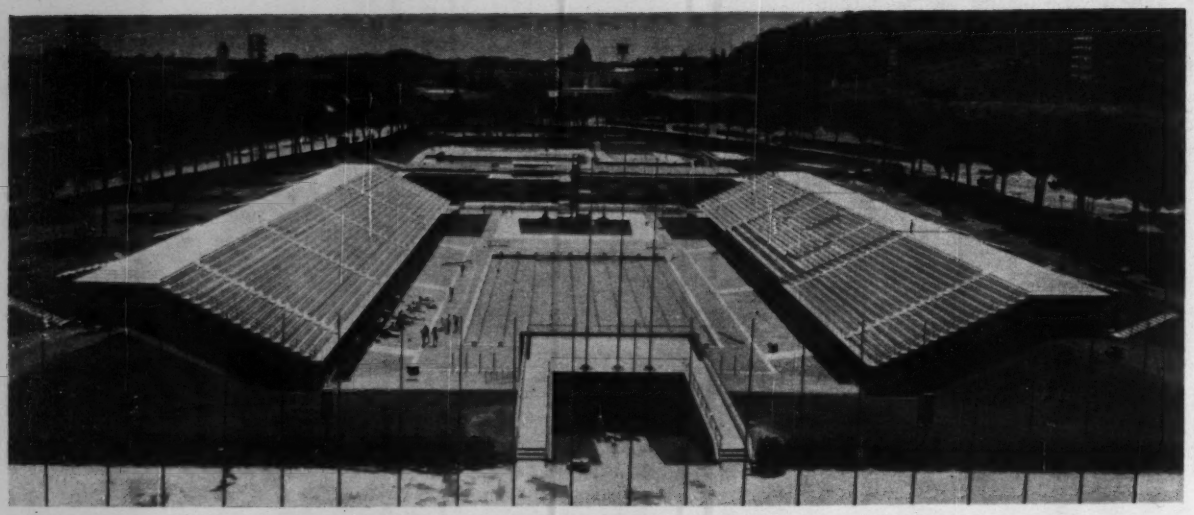
The glass-enclosed structure is scheduled for completion early this year.

• **The Little Sport Palace**—The Little Sport Palace has a 194-ft dome that is only 4¾ in., thick including insulation and roofing. The dome was designed as a ribbed membrane and rests on 36 Y-shaped bents. These carry stresses axially down to a prestressed concrete compression ring, 8 ft wide and 276 ft in diameter.

The shell top was erected with 1,620 precast, reinforced concrete sections. During construction these were supported on a network of temporary scaffolding. Connecting ribs were poured in place together with 1¼ in. of roof concrete.

The inner hall seats 5,000 and will be used for boxing, wrestling and basketball.

The structure cost $425,000. Annibale Vitellozzi was the architect. Mr.



Swimming stadium includes varied-size pools, and bleachers that seat 20,000.

Velodromo, a $1.45-million, 438-yd-long cycling track also seats 20,000.

Nervi was engineer on the project.

• **Flaminio Stadium**—The soccer stadium is built of 7,652 precast concrete sections. Precast reinforced concrete beams form the stadium frame, with triangular sections spanned between them. The triangular sections do two jobs—tie bents together, acting as lateral framing in the structure; and form stadium seats.

The precast seat and frame members are curved at both ends of the stadium to carry the seating levels in a continuous line rather than in a series of broken chords.

Circular concrete-filled steel columns carry a cantilevered roof on one side of the stadium. Framing bents extend above and beyond the rear edge of the structure to act as tie downs at the rear of the roof canopy.

The Flaminio Stadium will have a seating capacity of 50,000, including 7,000 covered seats. The playing field is 345 x 230 ft and has a complete network of drains and sprinkling system outlets. The field will be lit by 240 arclights.

An enclosed, 82 x 32 ft swimming pool is built under the stand.

The stadium was opened last March. Its total cost was $1.45 million. Pier Luigi Nervi and Antonio Nervi designed the structure.

• **Additional sports structures**—The most recent of the completed Olympic structures is the new swimming stadium, built at a cost of $1.2 million. The plant consists of a number of pools of varied sizes and depths, the largest measuring 82 x 164 ft.

Bleachers seating 20,000 people flank the competition pools. Because many of the contests will be held at night, the pools have underwater lighting and reflectors. Four 82-ft high metal towers will light the area from above with 100 beams. Architects Enrico Del Debbio and Annibale Vitellozzi designed the plant.

A $1.45 million cycling track called the Velodromo will be inaugurated this spring. The track, built of hardwood imported from the Cameroons, runs for 438 yds and is 24½ ft wide. As many as 20,000 persons can be accommodated in three tiers of seats.

Dressing rooms for the cyclists are built away from the track stadium. An underground runway will allow athletes to cycle directly into the area. An arc-light system permits nighttime contests. Clemens Schurmann was the architect.

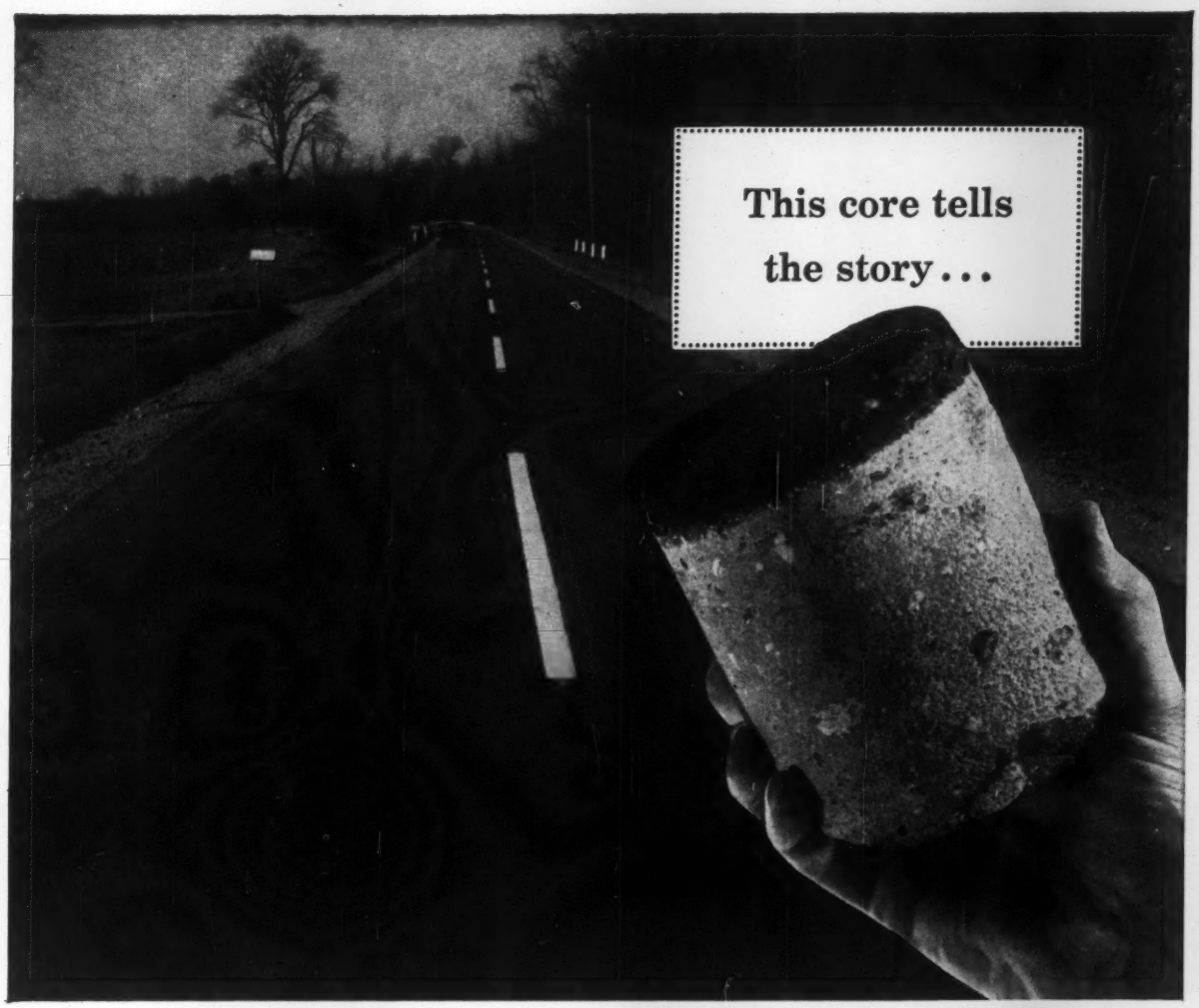
Not far from the cycling arena Rome has built auxiliary facilities to accommodate the expected overflow of Olympic activities. These include: a pool for water polo contests, two hockey rinks, a roller skating rink, soccer field, 13 fields for basketball, a sprinting track and 15 tennis courts.

• **City within a city**—The "city" to house athletes is designed as a series of two- and three-story apartment buildings containing a total of 4,500 rooms. The first floor of each structure is raised on reinforced concrete pillars with tiled facade screens.

For the women athletes, a separate, but complete village, is being constructed nearby. The Olympic city will have its own post office, restaurants, shopping center, laundries and barber shops.

When the games are over, the area will be turned into homes for government employees.

Architects for the Olympic city are: Vittorio Cafiero, Adalberto Libera, Amedeo Luccichenti, Vincenzo Monaco and Luigi Moretti.



By 1958, compressive strength had increased to 2,150 psi on this 1940 road in Androscoggin County, Maine. This soil-cement pavement has successfully withstood temperatures from –28°F. to 102°F. Approximate average precipitation for this area is 40 inches.

18 years on Maine's Route 136

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Proved again – soil-cement holds up like no other low-cost pavement, delivers long years of service as shown on Maine's Route 136.

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And soil-cement is stronger inch for inch than any other paving material short of concrete. No potholes or soft spots. Upkeep is low.

Low first cost, low maintenance and long life stretch road budgets, permit long range programming by highway engineers.

It's America's fastest-growing, low-cost pavement. In 1958, contracts for soil-cement on roads, streets, shoulders, subbase, airports and parking lots were almost double the previous year. Free, illustrated literature, distributed only in the U.S. and Canada, on request.

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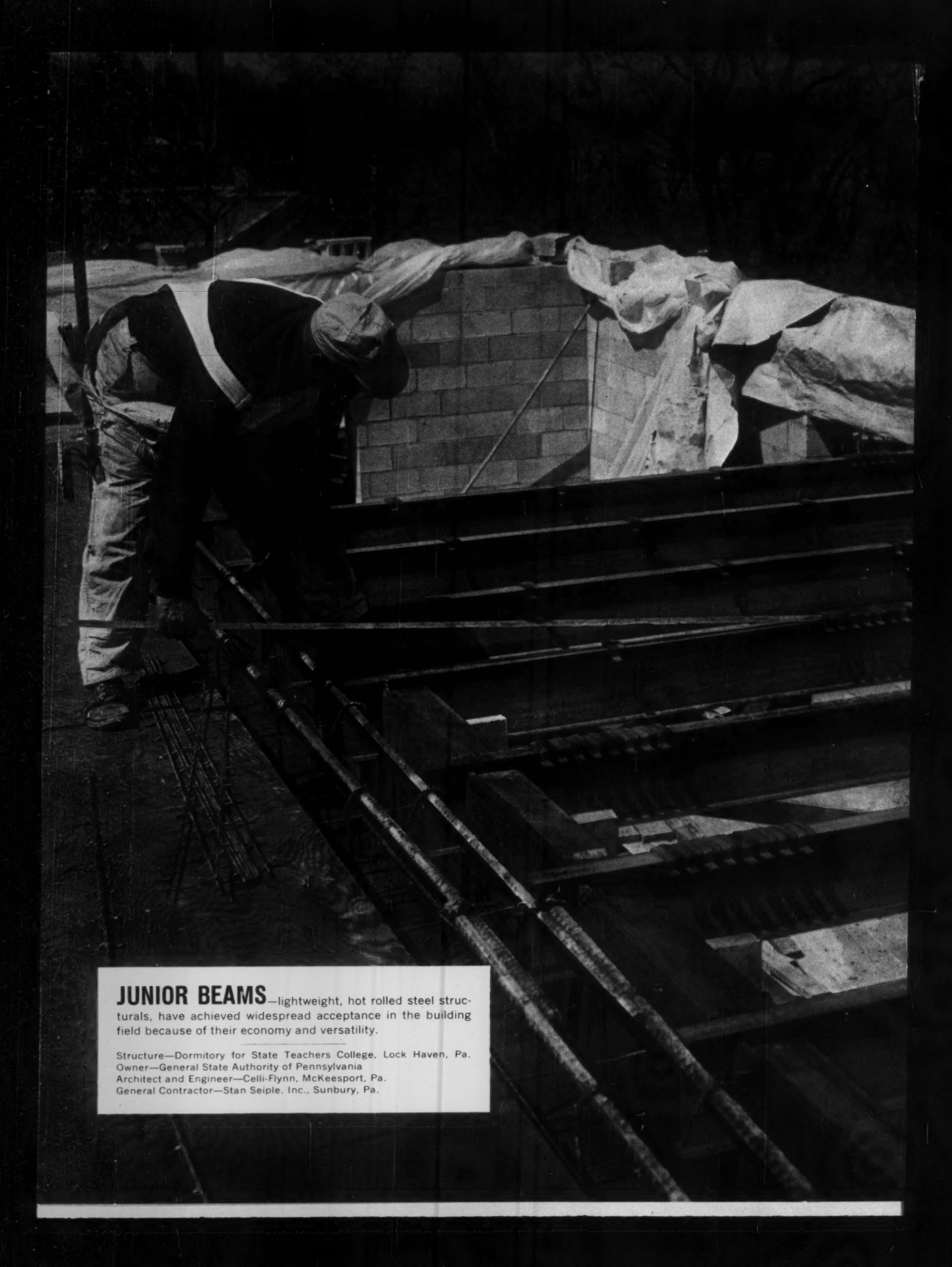
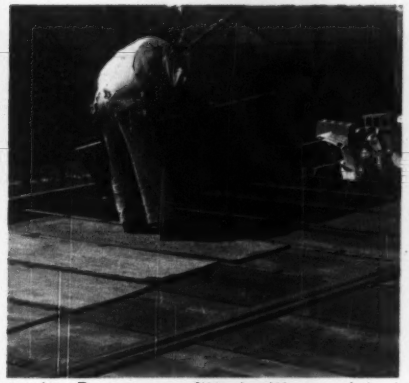


JUNIOR BEAMS—lightweight, hot rolled steel structurals, have achieved widespread acceptance in the building field because of their economy and versatility.

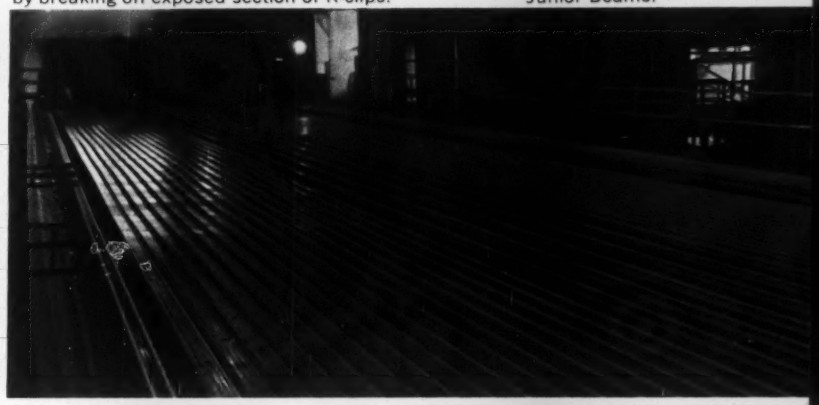
Structure—Dormitory for State Teachers College, Lock Haven, Pa.
Owner—General State Authority of Pennsylvania
Architect and Engineer—Celli-Flynn, McKeesport, Pa.
General Contractor—Stan Seiple, Inc., Sunbury, Pa.



Junior Beams are fitted with special K-clips to support plywood forms for concrete forming.

Concrete floor gets the finishing touch. Plywood forms are removed from below by breaking off exposed section of K-clips.

All intermediate floor and roof members in the structure are J&L Junior Beams.



Junior Beams are produced by J&L in 6″, 7″, 8″, 10″ and 12″ sizes in A-7 and high tensile grades.

College dormitory erected for less than $3,000 per bed

"We attribute a major share of cost reduction to the Junior Beam floor framing system"

. . . reports Celli-Flynn, Architects and Engineers

"This is the lowest cost-per-bed project of nine comparable dormitories built in recent years on the campuses of Pennsylvania State Teachers Colleges," says a partner in the firm. "This savings was accomplished despite increased material and construction costs and the low figure includes the extra expense of built-in furniture."

All intermediate floor and roof members in the structure are J&L Junior Beams, while the main structural frame is reinforced concrete. Here, significant labor savings were achieved because lightweight Junior Beams were raised and positioned rapidly, and were delivered to the job cut to length.

Additional time was saved through the use of an unusual method of forming the concrete floor. This method, known as the K-System, utilizes special cast iron K-clips which are fitted to the top flange of the Junior Beam. The clips support 24″ x 96″ plywood forms between the beams.

Investigate Junior Beam—K-System construction. Junior Beams are easily adapted to a wide range of architectural design. For further information consult your local steel service center, your nearest J&L district sales office, or write directly to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Columbia Calcium Chloride, effective all year, is especially beneficial in concrete when temperatures drop below 70°.

Spring chill slowing down your concrete jobs? Stay on schedule with Columbia Calcium Chloride

Warm spring days are almost here. But don't be caught off guard. There are still plenty of days—and nights—ahead when temperatures will skid below 70°. And you're still faced with the problem of keeping jobs on schedule in spite of the lag in concrete set caused by these low temperatures. You can keep cold weather jobs *moving* by adding Columbia Calcium Chloride at the rate of 2% by weight of cement to your mix. Columbia Calcium Chloride gives you these time-and-profit-saving benefits:

Higher Early Strengths—at 40°F, you get 3-day strength in 1 day, 7-day strength in 3½ days. There's no cold weather lag in strength gain; your job stays on schedule.

Faster Initial Set—Under normal conditions, Columbia Calcium Chloride cuts initial set time from 3 hours to 1 hour. At lower temperatures, the effects are even more pronounced. You get finishers on and off the job faster, avoid costly overtime.

Early Form Removal—Rapid strength gain permits removal and re-use of forms in about half the normal time.

Are you getting these Columbia Calcium Chloride cold weather benefits on your concrete jobs? If not, better analyze your batching procedure or contact your ready mix supplier today. Specify Columbia Calcium Chloride. For more information, contact our nearest District Sales Office or write our Pittsburgh Office.

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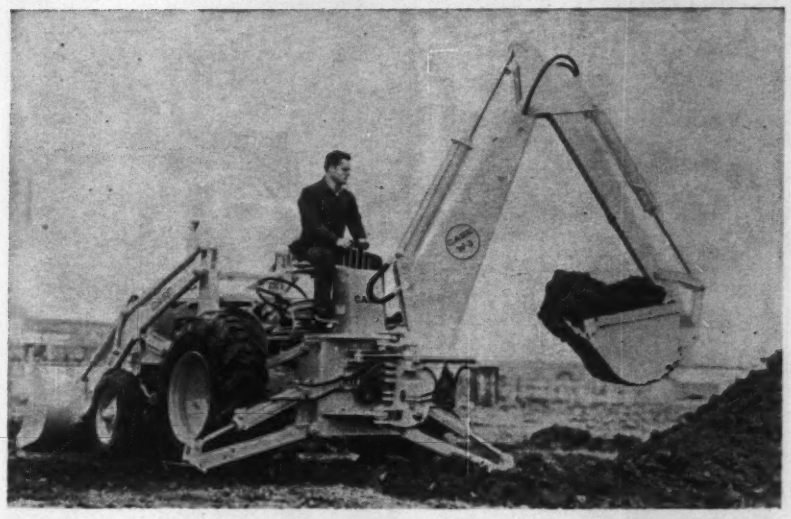

More 'Push' in Wheel Loader

The W-3 wheel loader has a lifting capacity of 2,500 lb and is powered by a 47 gross hp, high torque, overhead-valve Case engine. The engine is equipped with an 11-in. diameter master clutch and extra-large main and connecting rod bearings.

The model has hydraulic torque-converter drive. The converter is said to give the unit up to 56% greater push power than conventional gear-shift units at working speeds. A simple lockout lever, mounted on the dash panel, permits switching from torque-converter to direct drive on-the-go, for fast street or highway travel between assignments, and for safer downhill operation.

Standard on the W-3 is a synchronized shuttle transmission that permits smooth shifting from forward to reverse (and vice versa) in one easy motion without clashing gears. Reverse speeds are 27% faster than forward in each gear. The unit has an hydraulically actuated power-steering system.

The W-3 comes equipped with a standard 1 5-cu-ft capacity loader bucket, with ¾-cu-yd tread-width bucket, ¾-cu-yd dry material bucket, and a 1-cu-yd snow bucket available as optional equipment. Also optional and interchangeable with the loader bucket are pallet forks, log forks, a dozer blade and a crane boom.

A new heavier-duty backhoe has been designed for the W-3. It digs to a depth of 14 ft, reaches 20 ft from the front axle, and has an operating radius of 16 ft 9 in. from pivot. Hydraulic foot-operated swing controls enable the operator to swing the hoe boom a full 180 deg. The backhoe is available with a variety of optional buckets, including 18-, 24-, and 30-in. standard trenching buckets; 12-, 16-, and 30-in. bellhole buckets; a 36-in. combination grave and bellhole bucket, and a 38-in. grave bucket.

The backhoe is interchangeable with a rear counterweight should the owner wish to operate the loader alone. Use of a rear mounted Eagle Hitch also makes it possible to attach an all-purpose blade with scarifier, a post-hole digger, rotary cutter, rear-mounted mower or other rear-mounted attachments. J. I. Case Co., Racine, Wis.

Infra-Red Heat for Large Areas

Perfection-Schwank gas-fired, infrared heaters, ranging from 12,000 to 48,000 Btu/hr save fuel costs in space-heating installations, the manufacturers say. The infra-red units make practical the heating of roof-monitored factories, warehouses, and garages without use of ducts, blowers, or heat exchanges. Economies in electrical power and equipment maintenance are also obtained, according to the manufacturer.

Heating high-ceilinged buildings is the principal application. Parabolic reflectors can be mounted up to 45-ft heights. The reflectors direct the rays.

For lower ceiling heights, plane-surfaced reflectors provide a spread pattern of radiation for units mounted 10 to 20 ft above the floor. Perfection Industries, Division of Hupp Corporation, 1135 Ivanhoe Road, Cleveland 10, Ohio.

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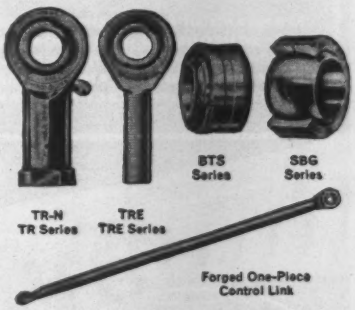
If you have applications involving linkage or transfer of motion, SPHERCO Bearings can supply your needs in a wide variety of materials with a quality that will give you top performance under normal or high temperature conditions.



WRITE FOR BULLETIN 257

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- UNIVERSITY PARK, STATE COLLEGE, PENNSYLVANIA; VIRGINIA ENGINEERING COMPANY, INC., NEWPORT NEWS, VIRGINIA—GENERAL CONTRACTOR.
- FIELD HOUSE & DORMITORIES, TULANE UNIVERSITY, NEW ORLEANS, LOUISIANA; FARNSWORTH & CHAMBERS COMPANY, HOUSTON, TEXAS—GENERAL CONTRACTOR.
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WORKING WITH THE NATION'S LEADING BUILDERS, STANDARD ROOFING COMPANY IS PROUD OF THE PART IT IS PLAYING TO HELP BUILD FOR AMERICA'S FUTURE.

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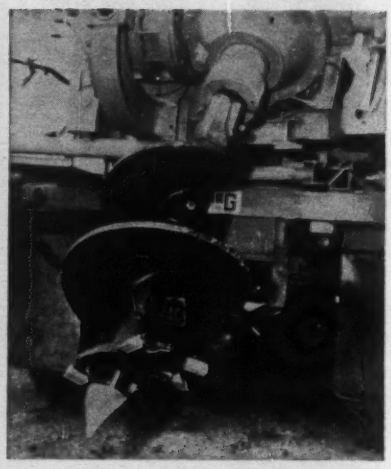


PoleBore Auger Works In Wide Range of Soils

An auger that can be adapted to almost any standard earth boring machine has been introduced by Trainer Associates. Called the PoleBore, the auger comes in standard sizes ranging from 10 in. to 36 in. in diameter and can be purchased on special order in larger sizes. It can be used for vertical, horizontal or battered holes and, according to the manufacturer, is effective in almost any type soil.

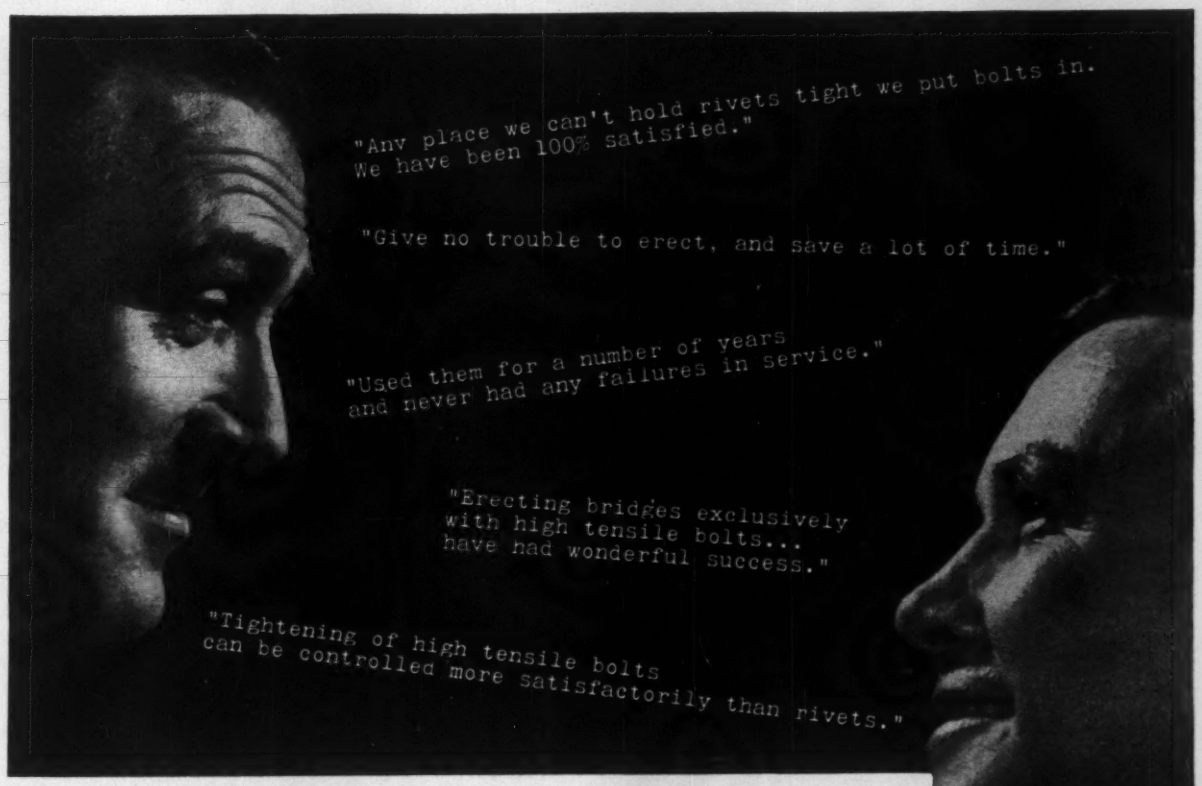
The PoleBore is said to be particularly efficient in digging hard or soft rock and in areas where there are stones or small boulders. Hardened teeth, set in sockets at the edge of the flights, assist in loosening, cutting or displacing the rocky material. These teeth can be removed and replaced without any special tools; a hammer and a screw driver will do the job.

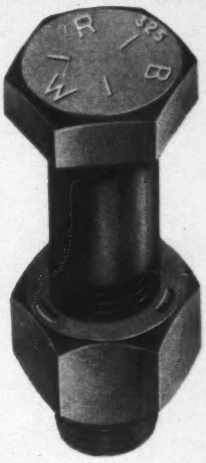
A replaceable penetrator point mounted at the base of the auger serves as both a centering tool and a primary cutter. The digging depth of the PoleBore is dependent on the type of boring machine on which it is mounted. TRAINER ASSOCIATES, INC., NEW CASTLE, DEL.

Wheel in Concrete Saw Means Straight Lines

A lockable wheel in its tricycle undercarriage enables the E/E Tri-Line Concrete Cutter to saw arrow-straight lines. Direct hydraulic blade-depth control and segmented diamond blades are other features of the cutter.

The cutters are available in manually propelled or gasoline-driven models. They can effectively cut asphalt as well as concrete, according to the manufacturer. ENGINEERING EQUIPMENT, INC., WATERLOO, IOWA.


"Any place we can't hold rivets tight we put bolts in. We have been 100% satisfied."
"Give no trouble to erect, and save a lot of time."
"Used them for a number of years and never had any failures in service."
"Erecting bridges exclusively with high tensile bolts... have had wonderful success."
"Tightening of high tensile bolts can be controlled more satisfactorily than rivets."



What they're saying about

High Strength Bolts

These quotes were recorded at a meeting of coal and ore dock men discussing high strength bolts in ore unloaders and bridges.

It's significant that where there's trouble with rivets, high strength bolts solve the problem. Good reason for this. Rivets do not always fully fill holes. This means a weaker joint. But *bolts* don't have to fill holes completely. Properly tightened, they prevent slippage and develop maximum shear strength of the connection.

Moreover, even when *perfectly* installed, rivets can't compare in clamping force to RB&W High Strength Bolts. For example, a 1-inch rivet upon cooling will exert 20,000 pounds of clamping force at best. But a 1-inch bolt torqued tight will clamp with 42,000 pounds. And remember, the *higher* the clamping force, the *stronger* the connection becomes. Better able to withstand dynamic loads and *stay tight*, too.

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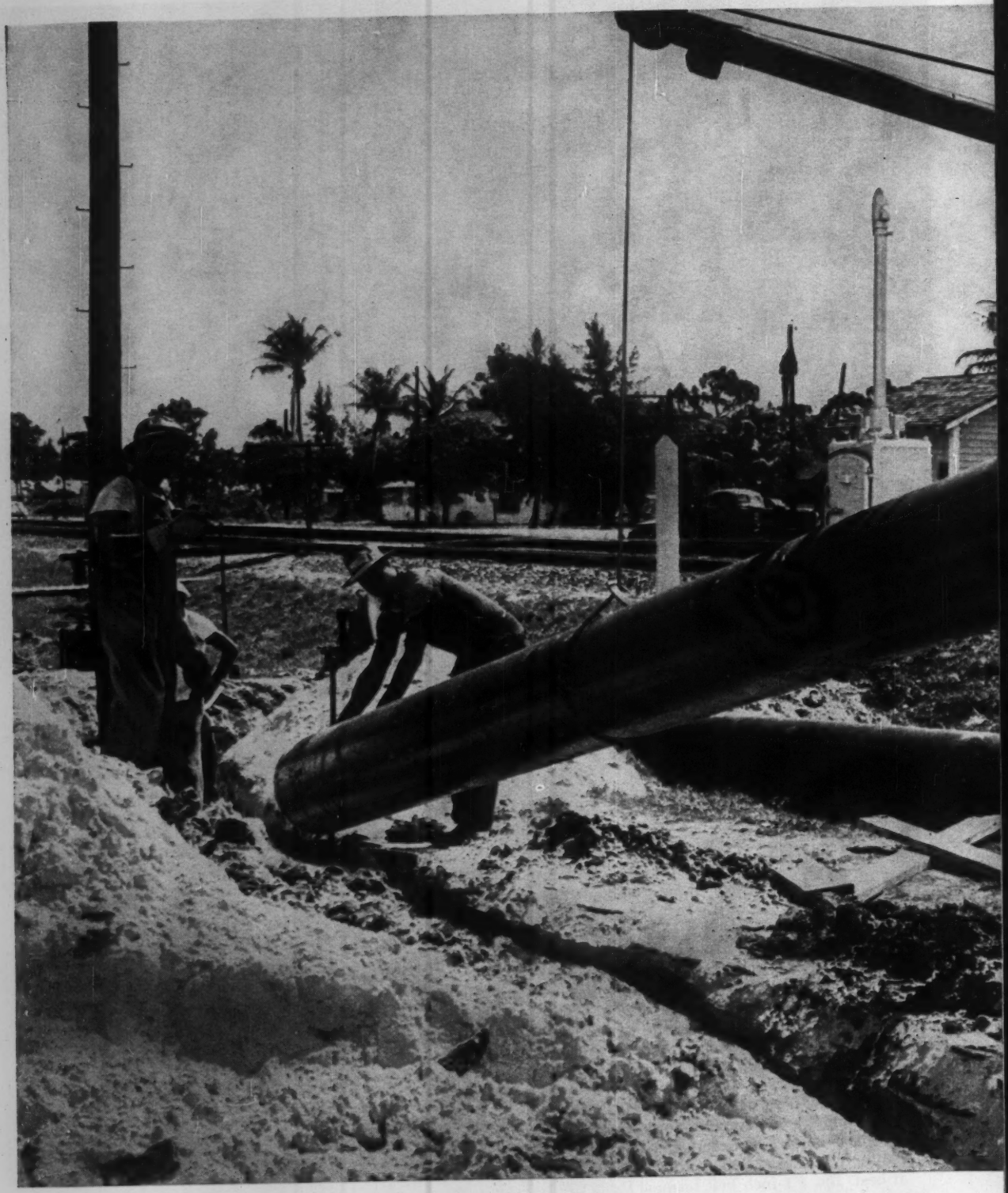
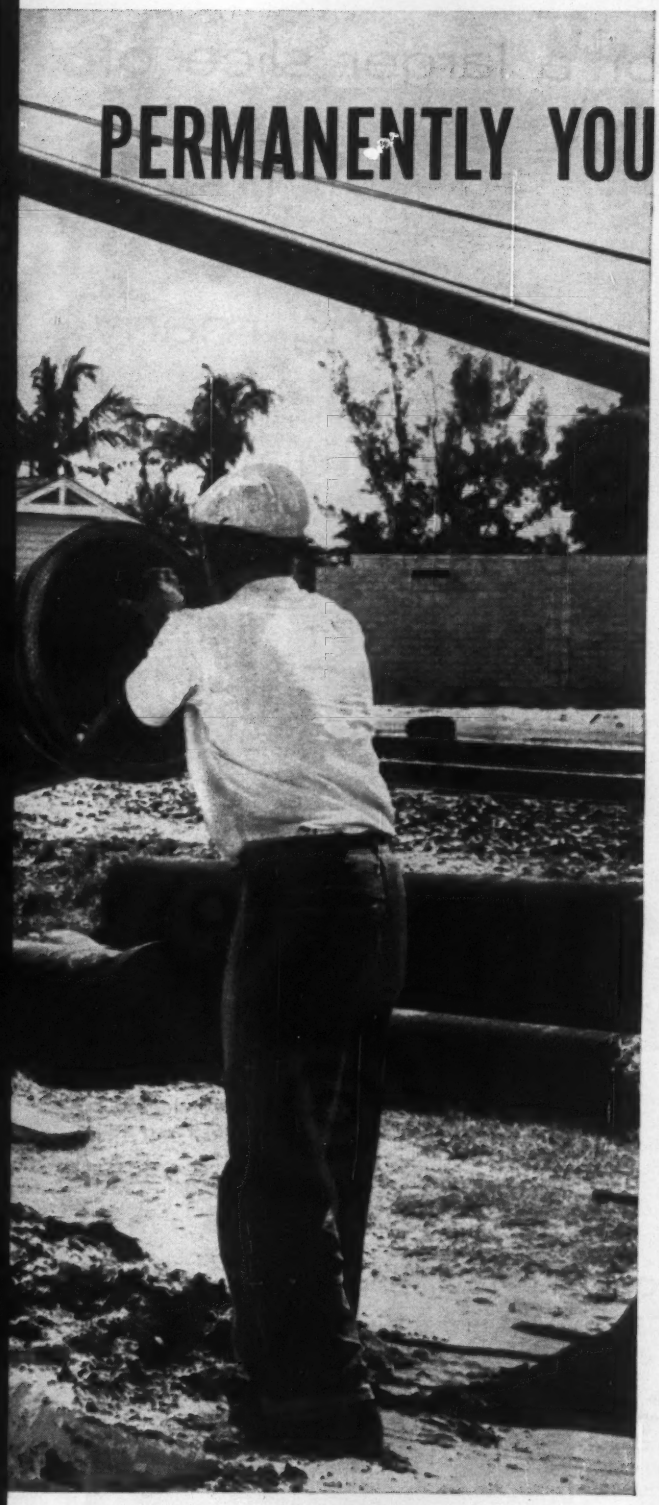


THE MARK OF THE 100-YEAR PIPE



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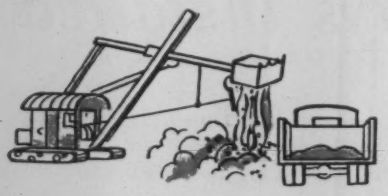
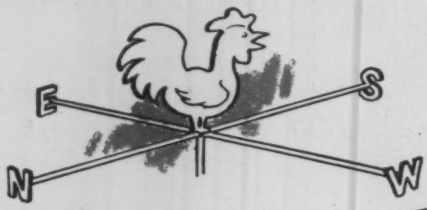
Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE

AIMING for a larger slice of construction contracts in your area? Afraid you're missing many  bidding opportunities? Tired of guessing where your next jobs will be coming from  ? You need daily Dodge Reports !!

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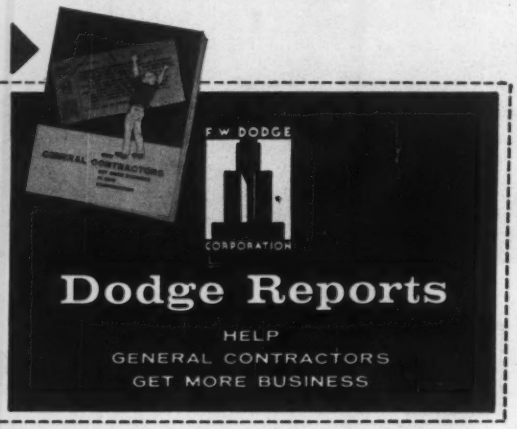
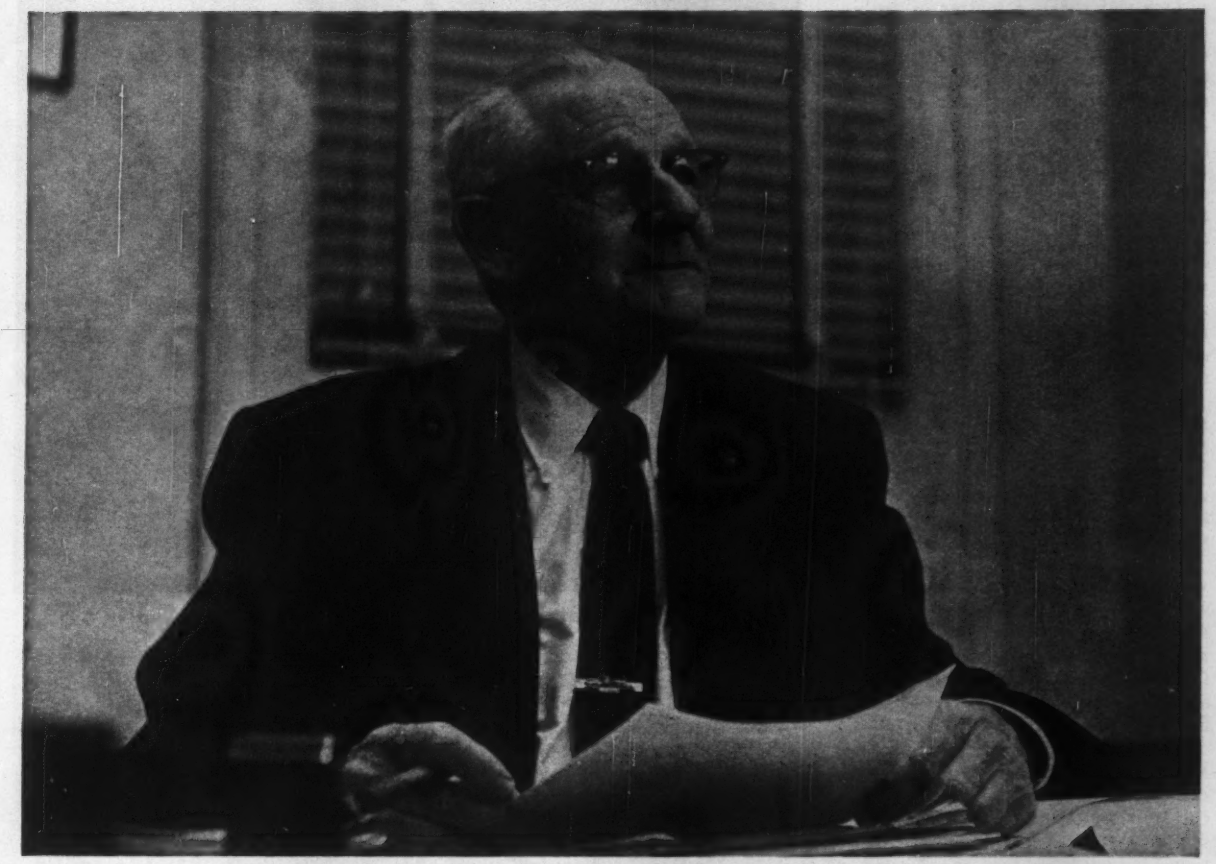




Fred H. Waring—elder statesman among state sanitary engineers—knows . . .

How to Stop Water Pollution

A man who's been hard at it for 44 years—33 of them as chief engineer of a state health department—can develop a sound philosophy of how to control water pollution.

Ohio's Fred H. Waring is such a man.

His philosophy, part of a legacy he'll leave when he retires later this year, is simply:

Reasonableness.

That one word has been the cornerstone of Fred Waring's success in Ohio. It was also the foundation of his effectiveness through the dozen years he served as secretary for the negotiating group in eight states that created the Ohio River Valley Water Sanitation Commission in 1948.

This old-school sanitary engineer, a water and sewage-treatment man steeped in practical solutions to these problems, has spanned distinct eras of environmental control and has made his mark in each. His record of accomplishment, measurable in water plants and waste water plants—and to a lesser degree in the installation of other public health projects—has rated him the esteem of other state sanitary engineers.

When Fred Waring began his career in the Ohio health department in 1916, it was tougher selling communities on their need for sanitary facilities than it is today. He started, he says, as a "young cub," the No. 5 man in a five-man engineering staff of the old State Board of Health.

"Those were the days when people didn't believe in bacteria," he says. "You had to sell them on the need for a waterworks by telling them it would take the mud out of their bath water."

Fred Waring was among the nation's pioneers in sanitary engineering. He came out of Worcester Polytechnic Institute to join Metcalf & Eddy in 1912 and worked for the Boston firm on a Cincinnati water report. He spent 1915 in the Panama Canal Zone—first operating a waterworks on the Atlantic side and then operating the Mira Flores plant on the Pacific side. Back in the states in 1916 he saw his future in the Midwest and joined the state agency from which he'll retire next October.

"That was the era of real resistance to sanitation," he says of his early days in Ohio. "In 1920 there was a typhoid epidemic that had 820 of the 9,000 people in Salem, Ohio, in bed. Martial law was declared. Still, people throughout the state went right on drinking their water straight, untreated, through the twenties and into the thirties.

"Federal expenditures, PWA and WPA incentives, were a help in getting water plants and sewerage built in the thirties. And in the forties the heavy pollution load on streams and on waterworks helped make folks more public health and quality conscious. First they wanted safe water. Now they want their water softened, free of iron—and they want it done yesterday.

"With 75% of our people drinking surface water, it's a matter of curbing water pollution and refining water treatment. If every city were situated like our Lake Erie cities, where they 'bugger up' their own drinking water if they discharge pollutants, it would be easy to get action."

But away from the Lake, on Ohio's rivers, too many small towns still discharge waste waters to the next town downstream. Getting them to clean up is not so easy, but it's possible; it's being done. The Waring philosophy of reasonableness is paying off. In all Ohio there are only about 200,000 people in communities still needing sewage treatment plants.

Fred Waring's recollections of how the Ohio River Valley Water Sanitation Commission (ORSANCO) was formed and his descriptions of how it works as the eight-state coordinator on a regional clean-streams program bespeak the philosophy of the man:

"The negotiating committee [of which he was secretary] worked from 1935 to 1948—five men from each of the eight states. It took time to develop the format, then get the states to okay it. The compact was drafted in 1938 and Congress ratified it in 1940, after five of the eight states had signed.

"Each state waited for the others. West Virginia wanted Virginia in, because of pollution from coal mines in the upper New River valley. Virginia had to work out its own state laws for pollution control. Finally, in 1948 all the states had signed.

"ORSANCO is a promotional and coordinating agency; but it also has legal authority. States' rights are protected under the compact, but each state has a solemn obligation under the ORSANCO compact to meet interstate requirements. And the states are living up to their responsibilities in fine fashion. ORSANCO has not yet had to take a community to court."

Gallipolis, a town on the Ohio River, defied the state on pollution-abatement orders a few years back. The Ohio commissioners on the interstate agency petitioned ORSANCO to intervene; this was enough to bring about action and Gallipolis is now completing its sewage treatment plant.

Huntington, W. Va., is another community that has been tardy on pollution control, he says, and which is now getting attention from the eight-state compact commission. Recognizing its obligations under the compact, the West Virginia state agency would not approve a nine-year program offered by Huntington, but lacked legal authority to demand faster action. ORSANCO now has made it known to Huntington—last major city on the Ohio River without a sewage works—that its timetable is unacceptable (ENR Feb. 4, p. 26).

"No law is any better than the public opinion behind it."

Mr. Waring describes the regulatory process to prove the reasonableness of it all. And he delights in pointing out how well the reasonableness of pollution control is finally being made understandable to the public.

"No law is any better than the public opinion behind it," he says. "And, my gosh, public opinion is out in front of us now, pulling for pollution abatement. Now we've got to give the service the public demands."

In Ohio, Fred Waring's "service" is the approval of plans for water and sewage works, and the supervision of their operation. His Division of Sanitary Engineering has a staff of 27 engineers and 23 sanitarians working in four districts. In addition, the division works with and for the Water Pollution Control Board in the study of pollution cases, the issuance of permits to control them, and the requirement of steps to stop them.

Since Ohio's new pollution abatement law became effective in 1952, everybody discharging untreated wastes must have a permit—or be in violation. Each permit issued has a time limit for action to correct the pollution conditions. Since 1952, Ohio communities have built 125 sewage treatment plants (some replacing old plants), and they have rebuilt 45 old plants.

Fred Waring thinks this is "a wonderful showing."

"We've made a whale of a dent! More plants have been built in these seven years than ever before. It's not only remarkable progress; it's dang pleasing," he says.

How do you get a village of 2,000 to spend money for sewage treatment? You help them study their finances, says Mr. Waring. If the financial experts say the town can't sell bonds, the WPCB postpones, gives them another year; federal aid under P.L. 660 has been most helpful in some such cases, he says.

"You figure the needed plant's cost in dollars per capita, compare that with income per family from census reports, come up with proof of ability to pay and put it in terms of cigaret money for them," says Mr. Waring.

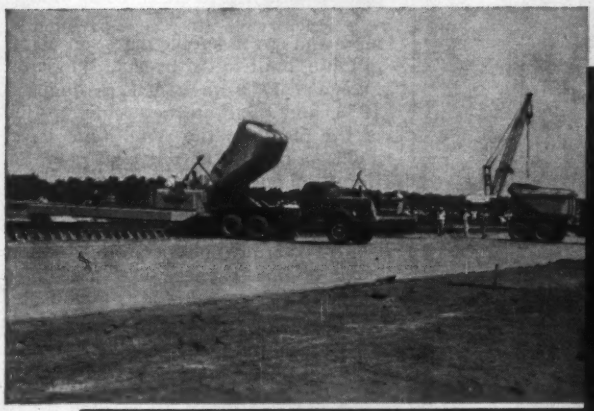
"The secret of it all is in being reasonable," he concludes.

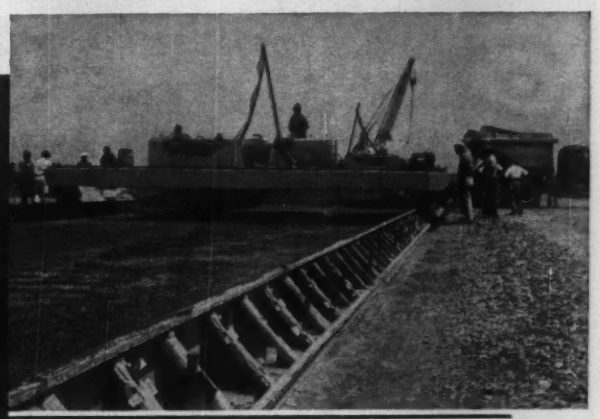
Fred Waring seems to know every water and sewage plant in his state like the back of his hand. He can recite the status of every big Ohio city's pollution control efforts. He also keeps his fingers on new processes, research and development being done in his state and elsewhere. In fact, he keeps his fingers on everything. No decision in his department, major or minor, escapes his attention.

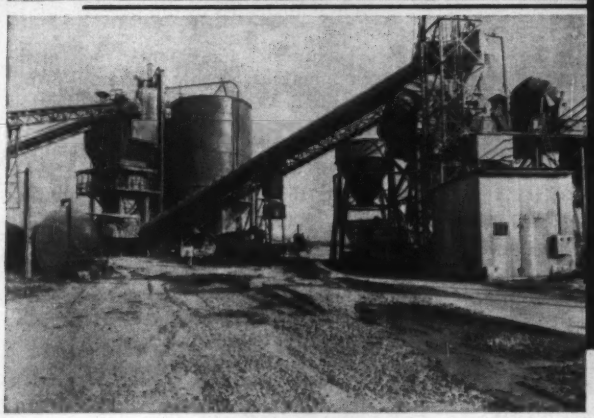
One new development he's watching is the one experimental sewage lagoon now installed in Ohio. These natural-treatment facilities are very successful in the Dakotas, where sunshine, wind and space are plentiful. Mr. Waring's purpose is to see if they can be used by small Ohio communities.

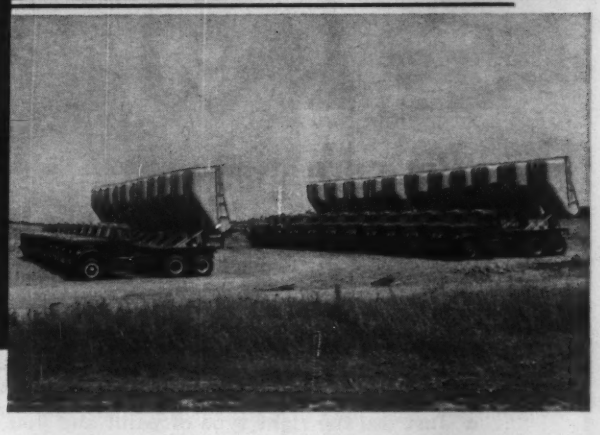
A second new development, for which

Dumpcretes and Dumpcrete Spreaders pace Chantilly paving job at 4000 cu. yds. a day









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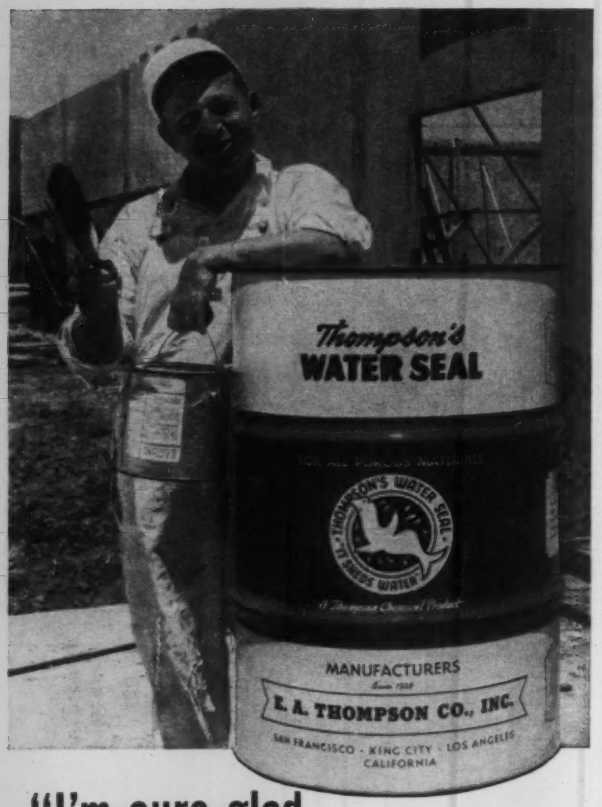

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he shows even more enthusiasm, is the aerobic digestion process he and his people have "borrowed" from the dairy waste treatment process for use in small domestic sewage plants. Employing the activated-sludge process principle, the plant is designed to consume all sludge.

Gradually, his division has permitted more and larger aerobic digestion plants in Ohio, built to its specified standards. Design data were issued in January, 1958, and there are now close to 300 of the plants in the state. One serves a village, but all the rest treat pollution from schools, factories, restaurants, shopping centers and small population centers.

Mr. Waring considers the development of this practical small-scale plant a real benefit to Ohio for its high degree of treatment at reasonable cost. He credits the manufacturers who have produced the plant's components for making it economical. His staff continues to study refinements of the process and its design.

Technical achievements, such as development of aerobic digestion plants, give Fred Waring obvious satisfaction. But his greatest satisfaction must come from his successes as an engineer-administrator who knew the practicalities of solving the problem of water pollution, who espoused reasonableness as the prime factor in his personal formula for success.

Seven Engineer-Geologists To Collect Antarctic Data

Four engineers and three scientists from the Department of the Interior have been assigned to Antarctica as part of the United States Antarctic program.

Three of the engineers are from the Geological Survey: Warren T. Borgeson who is accompanying the icebreaker assault; Louis J. Roberts, a member of the Victoria Land tractor-traverse; and William Chapman who is finishing an 18-month assignment at Byrd Station. Mr. Chapman has been navigating a 1,000 mile tractor-traverse through Marie Byrd Land.

Representing the Bureau of Mines is John J. Mulligan, mining engineer and geologist, working out of the U. S. base at McMurdo Sound. He is studying the technical problems involved in mineral explorations and development.

The three Survey geologists are Eugene L. Boudette, Alfred R. Taylor and Harold A. Hubbard. Mr. Boudette is with the tractor-traverse party in Marie Byrd Land, Mr. Taylor is the geologist for the Victoria Land tractor-traverse and Mr. Hubbard is serving as geologist with the scientific group attached to the icebreaker, Glacier.

. . . Men and Jobs

Public Works

J. P. Murphy has been appointed deputy highway engineer for the California Division of Highways. He has been serving as assistant state highway engineer since 1957. Mr. Murphy is a veteran of 30 year's service, joining the state's highways after his graduation from the University of California at Berkeley.

John N. Howard has been named resident bridge engineer in Portland for the Oregon Highway Department. He replaces Henry H. McClure, who has retired.

Eugene L. Langenderfer has been appointed location and design engineer for the Ohio Highway Department at Bowling Green. He has been expressway engineer in the Lucas County engineer's office.

A. H. Weber has been named TVA project manager for construction of the $1-million stream electric-power plant near Paradise, Ky. **J. R. Roundtree** is construction engineer on the project, and **Einar Haugen,** general construction superintendent.

C. E. Proudley has retired as chief of the Department of Materials and Tests of the North Carolina Highway Department. He joined the department in 1936 as engineer of materials and tests and advanced to department head in 1943. He took over as chief of the division in 1955.

Thomas Mumford has been appointed chairman of the Indiana Wabash Valley Compact Commission, which will work with a similar Illinois group to study the problems of the Wabash River Valley. Other members of the Indiana Commission are **Blucher A. Poole** of Indianapolis and **Clara Jean Baldwin,** Montezuma.

George P. Bauer has been named executive director of the Delaware County Housing Authority. He has been in the public housing field for 21 years and for the past three years has been assistant executive director for the East St. Louis Housing Authority.

Arleigh B. West is now Acting Regional Director of Region 3 for the Bureau of Reclamation. For the past 14 years he supervised the irrigation program in the region. He replaces **W. H. Taylor,** who has been appointed Chief of Division of Power Operation and General Engineering on the Assistant Commissioner and Chief Engineer's staff.

David L. Fosburgh, assistant planning and economics engineer for the New Hampshire Highway Department, has joined the Bureau of Public Roads as division engineer, with headquarters in Juneau, Alaska.

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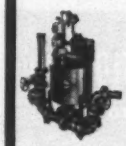

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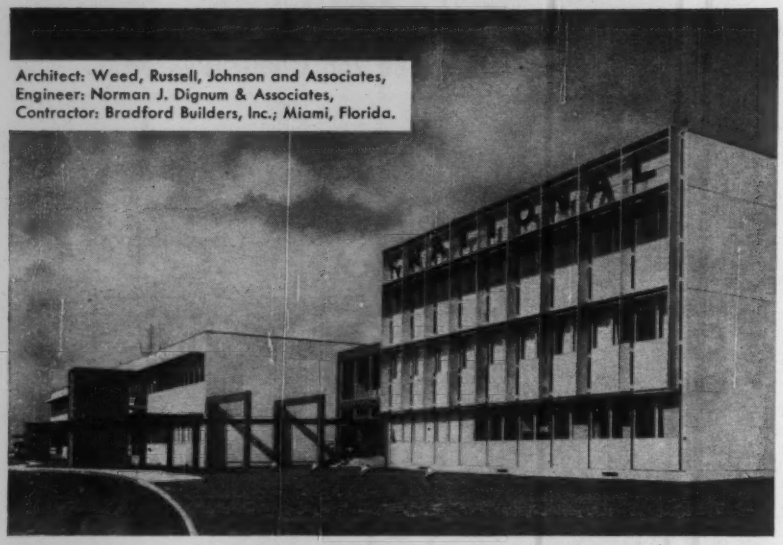

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Engineer: Norman J. Dignum & Associates,
Contractor: Bradford Builders, Inc.; Miami, Florida.

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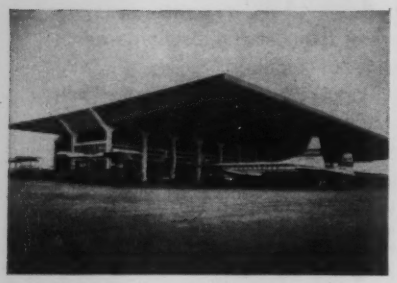

Architect:
Weed, Russell, Johnson and Associates,
Contractor:
Fred Howland, Inc.; Miami, Florida.
Consulting Engineer:
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Obituaries

Caleb M. Saville Dead; Worked on Panama Canal

The eldest member of a three-generation trio of engineering Savilles is dead at 94. Caleb M. Saville's death leaves a well-known son and a grandson active in engineering: Thorndike Saville, Sr., former dean of engineering at New York University and now on the faculty at the University of Florida; and Thorndike Saville, Jr., a member of the Corps of Engineers' Beach Erosion Board.

Caleb Saville worked under General George W. Goethals in 1907 on construction of the Panama Canal's Gatun Locks. From 1912 until his retirement in 1928, he was manager and chief engineer of the Metropolitan District Water Commission of Hartford, Conn.

Carl M. Pollock, 74, retired civil engineer for the Army and former chief engineer for the Kentucky Public Service Commission. After graduating from the University of Washington in 1916, he worked on the construction of the Alaska Railroad with the Alaska Engineering Commission. From 1932 to 1936 he was with the Washington State Department of Public Service.

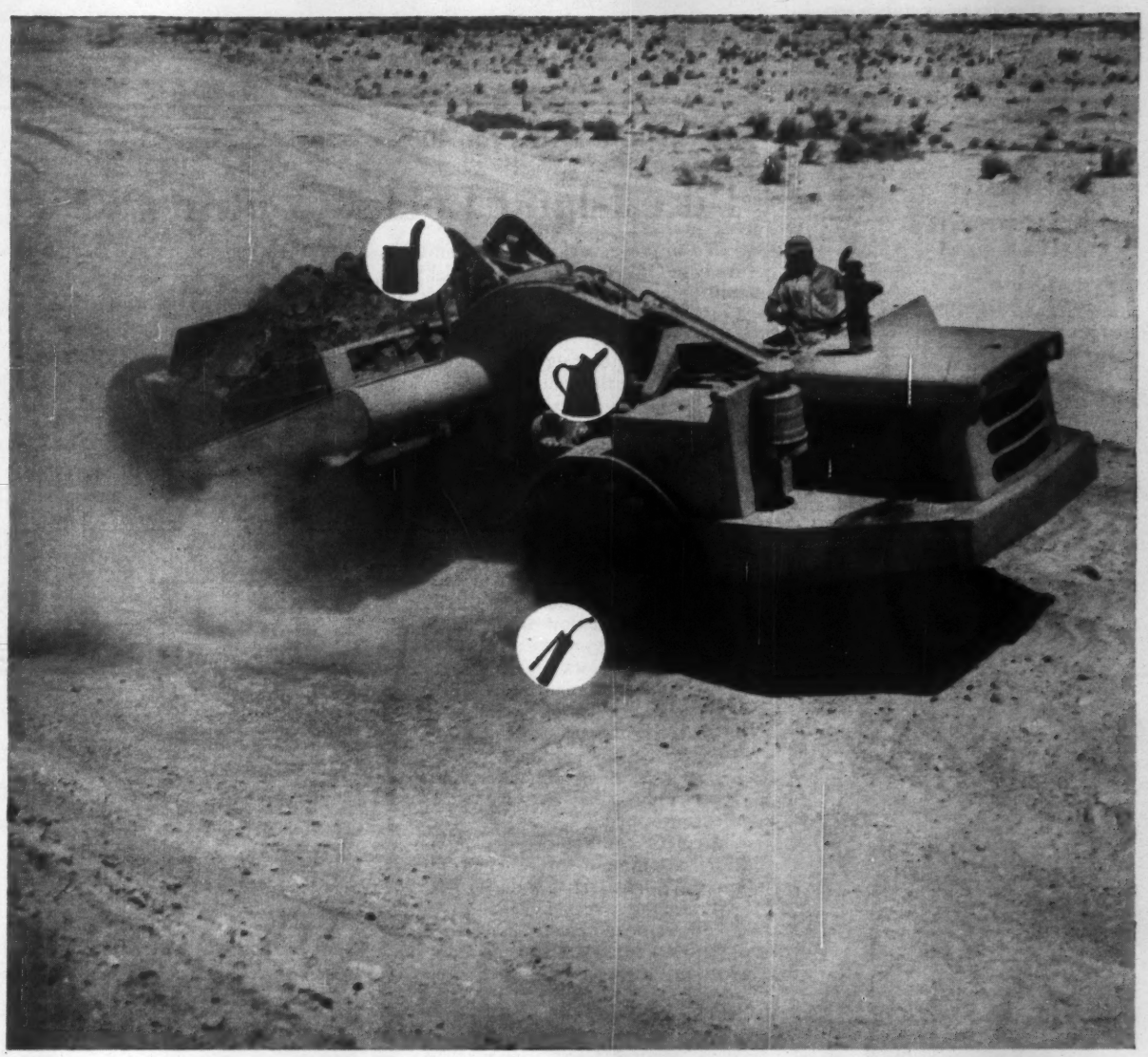
John M. Belknap, 66, retired Army engineer. He worked with the provisional corps of engineers in Puerto Rico and for two years was assistant chief engineer for the West Indies Construction Co.

O. C. Kohli, 57, partner in the civil engineer firm of Kohli and Kaliher, Lima, Ohio. He had also served as Ohio highway engineer for the division covering the northwestern counties.

G. B. Roth, 66, Philadelphia architect and retired partner in the firm of Roth and Fleisher. His company was given an American Institute of Architects award for participation in the institute's international exhibition in 1958.

Leo J. Ehrhart, 70, retired New York City civil engineer active in developing City Island and Long Island. He was a consulting engineer for the borough of the Bronx and also a member of the City Planning Commission.

Michael R. Lally, 36, secretary-treasurer of the Massachusetts State Building and Construction Trades Council, AFL-CIO. He was president of Local 15 of the bricklayers union and was formerly superintendent of the NDC Construction Co., Boston.



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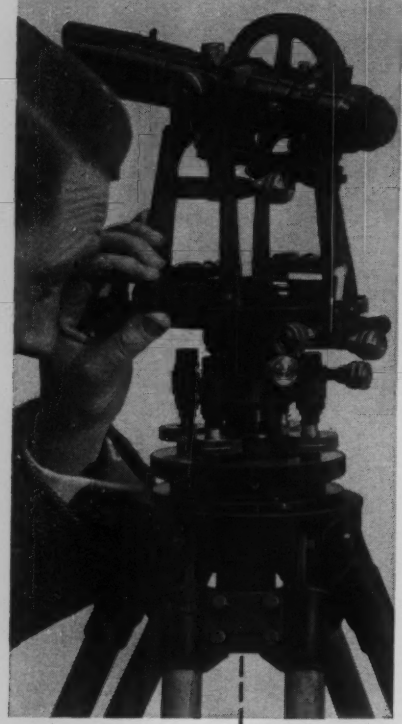

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Concrete accounts for 40% of . . .

Pike Island Locks Contract

To improve navigation on the Ohio River in Ohio County, two parallel locks will be constructed for the Pike Island Locks and Dam projects, about six miles above Wheeling, W. Va.

The Corps of Engineers, Pittsburgh, Pa., awarded the contract at $22,868,707 to Dravo Corp., Pittsburgh. The award was 4.4% under the engineers estimate and less than 3% under the nearest bid submitted by Geo. M. Brewster & Son, Inc., Bogota, N. J.

Usable dimensions of the main lock chamber are 110 ft x 1,200 ft, and of the auxiliary chamber, 110 ft x 600 ft.

Concrete, 221,300 cu yd at $12 a yd, for lock wall foundations, sills, guard wall end foundation cells, and upper guide wall caisson; and 368,200 cu yd at $18 a yd, for lock walls above foundations, guide and guard walls, filling and emptying laterals and cable and culvert discharge crossovers, accounts for over 40% of the total contract.

The steel sheet piling for cofferdam construction, 2,675 tons, will be government-furnished.

Cement content of concrete ranges from a minimum of three to a maximum of eight bags per cu yd.

Prevailing wages include: carpenter, $3.40; crane & power shovel operator $3.40; tractor operator, including bulldozer, $2.95; pile driver, $3.60; common laborer $2.40.

The bidding on this lock project included:

An additional 12% of the total cost goes into excavation and dredging—1,785,000 cu yd of common excavation at $1 a yd, 125,000 cu yd of rock excavation at $3 a yd; and 669,200 cu yd will be dredged in the upper and lower approaches at 80 cents a yd.

1C Dravo Corp., Pittsburgh, Pa.	$22,868,707
2 Geo. M. Brewster & Son, Inc., Bogota, N. J	23,554,745
EE Corps of Engineers, Pittsburgh	23,928,396

Bids: 11-19-59 Items	Unit	Quantity	Unit Prices IC
Cofferdams	ls	job	$1,950,000
Excavation, common, locks & appurt structs	cy	1,785,000	1.00
dredging in upper & lower approaches	cy	669,200	0.80
Excavation, rock	cy	125,000	3.00
Fill, pervious	cy	209,000	0.70
random	cy	189,000	0.50
in fndn cells for grd walls	cy	10,400	0.70
impervious	cy	2,400	5.00
Treat & protect exposed rock surfaces	sy	33,500	0.70
Topsoiling	cy	1,800	5.00
Steel sheet piling f&d	sf	216,200	3.00
Master piles f&d	lf	14,940	7.50
Steel bearing piles, vert 10" at 42/ f&d	lf	54,250	4.50
12" at 53/ f&d	lf	8,010	6.00
batter 12" at 53/ f&d	lf	5,940	6.00
Concrete (maximum 3" aggr) in lock wall fndns; sills, grd wall end fndn cells; upper guide wall caisson	cy	221,300	12.00
lock walls above fndns; guide & grd walls; filling & emptying laterals & cable & culvert discharge crossovers	cy	368,200	18.00
Paving & curbing of lock chamber, esplanade & sidewalk	cy	2,570	70.00
Conc work in recesses, pipe trenches & miscellaneous	cy	830	100.00
Portland blast furnace slag cement, furnish f	bbl	500,200	4.00
fly ash f	t	26,680	4.60
Steel reinforcement f&p	lb	2,987,000	0.13
Copper waterstops f&p	lb	8,440	2.50
Filter material	cy	15,600	3.00
Stone protection	cy	24,400	10.00
Derrick stone	cy	23,300	8.00
Debris dam stone	cy	1,240	6.00
Tainter vlv & liner f&i	ea	6	40,000
oper machinery f&i	set	6	35,000
culvert bulkhd f	ea	4	6,000
Lock gates (2 leaves, each gate) upper miter f&i	set	2	210,000
lower miter f&i	set	2	240,000
operating machinery f&i	set	8	40,000
Hydraulic piping system oil pumps, oil tank & control equipment f&i	ls	job	290,000
Compressed air piping system, air compressor & receivers f&i	ls	job	30,000
Gas piping system f&i	ls	job	2,000
Service water piping system & pump f&i	ls	job	28,000
Domestic water system f&i	ls	job	2,000
Fuel oil storage tank & piping system for standby unit f&i	ls	job	2,500
Wall armor f&i	lb	2,441,500	0.30
Steel castings f&i	lb	63,700	0.60
Misc metalwork f&i	lb	1,074,800	0.50
Guard fence f&i	lf	9,230	3.00
Aluminum handrail f&i	lf	665	10.00
Aluminum grating f&i	sf	9,460	6.00
Chain link fence f&i	lf	1,410	3.00
Timber f&i	Mfbm	6	600.00
Floating mooring bitts, except anchorages f&i	ea	24	4,000
Alum rabbet angles f&i	lb	4,200	3.00
Operations bldg, complete	ls	job	90,000
Pwr & ltg sys, complete f&i	ls	job	220,000
Diesel elec standby unit, complete f&i	ls	job	19,000
Cathodic protection for miter gates f&i	ls	job	60,000
Cor met pipe, furn & lay, 12" dia	lf	260	7.00
15" dia, perf	lf	965	8.00
18" dia	lf	580	9.00
24" dia	lf	390	11.00
Pipe inlets	ea	8	500.00
Bit surfacing on aggr base	sy	2,640	3.60
Flagpole, furn & erect, compl	ls	job	1,500
CIP culvert, 18", reinstal	lf	260	8.00
Pipe culvert extension, cast iron pipe, 18"	lf	40	25.00
concrete pipe, 15"	lf	55	20.00
Reinf prest conc manholes, approx 6- 8' deep f&i	ea	5	600.00
8-10' deep f&i	ea	2	800.00
CI soil pipe, 6", furn & lay	lf	440	5.00
Service bldg, complete	ls	job	50,000
Project info & permanent identification signs	ls	job	500.00
Highway guard rail	lf	40	7.00
Government field office	ls	job	15,000
Line drilling	sf	134,200	1.50
Core drilling, 2½" cores	lf	300	8.00
Control shelters	ea	4	2,500
Slushing stone protection with concrete	sy	80	10.00
Flap gate, 24"	ea	1	125.00
18"	ea	1	125.00

f Furnish f&d Furnish & drive f&i Furnish & instal
f&p Furnish & place

Commence: 12-15-59. Completion schedule: 1,050 cal days.
Liquidated damages: $800/cal day.

Labor and Materials Prices

Monthly Market Quotations by ENR Field Reporters

HOURLY WAGE RATES—Base rate + fringe benefits

	Common Labor: Building	Common Labor: Heavy Const	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Truck drivers: 1½ T	Truck drivers: under 4 cy	Truck drivers: over 4 cy
Atlanta	$1.90	$1.90	$3.90	$3.25	$3.45+7½¢	$3.60	$3.39	$3.50+10¢	$3.80+20¢	$1.90	$2.00	$2.25*B*
Baltimore	2.20+7½¢	2.20+7½¢	4.10+10¢	3.50+7½¢*f*	3.90+7½¢	3.35/4.05+10¢*A*	3.80+10½¢	3.75+7½¢	3.74+9½¢	2.15+7½¢	2.15+7½¢	2.25+7½¢
Birmingham	1.85	1.95	3.95	3.15	3.50+10¢*mn*	3.18	3.27	3.65	3.58+12½¢*p*	1.90	2.10	2.35
Boston	2.65+10¢	2.55+10¢	3.80+20¢	3.55+10¢	4.02+20¢	3.90+10¢	3.65+45¢	3.90+25¢	3.85+27¢*R*	2.70+8¢	2.70+8¢	2.70+8¢
Chicago	3.02½+7½¢	3.02½+7½¢	4.07½+7½¢	3.75+20¢*o*	4.15+16¢*n*	3.75+5¢	3.95+23¢	4.10	3.95+24¢	2.55+175¢*R*	.....	.....
Cincinnati	2.75	2.65	3.90+10¢	3.75*D*	3.80+10¢	3.475/3.70*A*	3.725+.04	3.97+39½	3.95+9½¢	2.55+62½¢	2.60+6½¢	2.65+6½¢
Cleveland	3.25*b*	3.165*b*	3.965+10¢*b*	3.99*b*	3.89+10¢*b*	3.99*b*	3.99*a*	4.05*b*	3.79+20¢*b*	2.82+15¢*a*	2.82+15¢*a*	2.82+15¢*a*
Dallas	1.80	1.80	4.00	3.35*b*	3.425+7½¢	3.50*B*	3.75+13¢	3.50+7½¢	3.575+8½¢	1.80/2.625	1.80/2.625	1.80/2.625
Denver	2.25	2.25	3.90	3.50	3.41+7½¢	3.15	3.625+12¢	3.75+14¢	3.80+10¢	2.40*B*	2.65*B*	2.80*B*
Detroit	2.80+42¢	2.80+42¢	3.90+30¢	3.55+42¢	3.90+22½¢	3.55+36¢	3.60+34¢	3.90+47	3.835+17½¢	2.95	2.95	2.95
Kansas City	2.455	2.505	3.95	3.50	3.55	3.445	3.75	3.75+355¢	3.80+9½¢	2.43	2.43	2.505
Los Angeles	2.88+10¢	2.88+10¢	4.00+25¢	3.60+20¢	4.07½+23½¢	3.61+15¢	4.125+42½¢	4.40+44	4.10+52¢	3.15½+10¢	3.15½+10¢	3.345+10¢
Minneapolis	2.70	2.70	3.875	3.45	3.62	3.45	3.50+33¢	3.55+39¢	3.62+20¢	2.70	2.70*d*	2.85
New Orleans	1.85¢	1.85¢	3.67+7½¢*ed*	3.20*d*	3.50+7½¢*ed*	3.325+7½¢*ed*	3.19+5¢*jk*	3.77+7½¢	3.60+17½¢*dl*	3.32+7½¢*ed*	3.32+7½¢*ed*	3.32+7½¢*ed*
New York	3.30+26¢*c*	3.30+26¢*c*	4.80+44¢	4.40+35¢*k*	4.60+47¢*j*	4.65+37¢	4.50+62¢	4.45+1.424	4.50+54¢	2.35+22½¢	3.40+28½¢	3.40+28½¢
Philadelphia*R*	2.50	2.40+10¢	4.10+17¢	3.785	4.30+23¢	3 935/4.215+10¢*A*	4.15+15¢	4.375+16¢	4.10+31½¢	2.45+15	2.45+15½¢	2.45+15
Pittsburgh	2.575+20¢	2.425+20¢	4.30+20¢	3.775+20¢	4.15+20¢	3.73+20¢	3.95+20¢	4.60+34½¢	4.00+20¢	2.50+20¢	2.635+20¢	2.735+20¢
St. Louis	2.775+10¢	2.775+10¢	4.05+32½¢	3.725+10¢*c*	3.75+7½¢	3.825	3.90+07½¢	4.11+31¢	4.07½+22½¢	2.80+12½¢	2.80+12½¢	2.80+12½¢
San Francisco	2.865+10¢	2.865+10¢	4.25+42½¢	3.55+30½¢	4.075+22½¢	3.405+10¢	3.79+63¢	4.22+20¢	4.14+59¢	2.81+20¢	2.75+20	2.89+20¢
Seattle	3.15+10¢	3.15+10¢	4.15+10¢	3.38+20¢	3.59+10¢	3.59+20¢	3.72+30¢	3.80+26¢	3.81+24¢	3.15+20¢	3.15+20¢	3.35+20¢
Montreal	1.65+4¢*q*	1.65+4¢*q*	2.45+5¢*q*	2.25+5¢*q*	2.45+5¢	2.35+5¢	2.50+5¢	2.35+5¢	2.47+5¢*n*	1.65+4¢	1.65+4¢	1.65+4¢
Toronto	1.85+7¢	1.85+7¢	3.00+12¢	2.80+11¢	2.90+12¢	3.05+12¢	3.00+20¢	3.30+13¢	3.20+13¢	1.90+14½¢	1.90+14½¢	1.90+14½¢

	Tractor Operators Incl. bulldozer: 34–49 hp	70–100 hp	100 & over	Tractor scraper: 15–16 cy	Power cranes & shovels: ½ cy	¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$3.00	$3.075	$3.075	$2.925	$3.45	$3.60	$2.925	$2.85	$2.00
Baltimore	3.65+10¢	3.65+10¢	3.65+10¢	3.65+10¢	4.05+10¢	4.05+10¢	3.65+10¢	3.25+10¢	2.25+7½¢
Birmingham	3.18	3.18	3.18	3.18	3.18	3.18	3.18	2.77	2.05
Boston	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.90+20¢	3.90+20¢	3.52½+20¢	3.45+20¢	2.80+10¢
Chicago	3.50+5¢	3.65+5¢	3.70+5¢	3.70+5¢	4.10+5¢	4.10+5¢	3.70+5¢	3.55+5¢	3.70+5¢
Cincinnati	3.475+10¢	3.475+10¢	3.475+10¢	3.475+10¢	3.475+10¢	3.70+10¢	3.70+10¢	3.70+10¢	3.70+10¢
Cleveland	3.74*b*	3.74*b*	3.74*b*	3.74*b*	3.99*b*	3.99*b*	3.74*b*	3.615*b*	3.615*b*
Dallas	1.80/2.625	1.80/2.625	1.80/2.625	1.80/2.625	3.225*h*	3.225*h*	1.80/2.625	1.95	1.95
Denver	2.40	3.00	3.00	3.00	3.15	3.15	3.00	3.00	2.53
Detroit	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.275+15¢	2.93+34¢
Kansas City	2.75	3.20	3.20	3.20	3.445	3.445	3.20	3.20	2.55
Los Angeles	3.91+15¢	3.91+15¢	3.91+15¢	4.01+15¢	4.01+15¢	4.01+15¢	4.01+15¢	3.13+15¢	3.09+10¢
Minneapolis	3.08	3.30	.....	3.30	3.52	3.78	3.08	2.97	2.85
New Orleans	3.325+7½¢*ed*	3.325+7½¢*ed*	3.325+7½¢*ed*	3.325+7½¢*ed*	3.325+7½¢*ed*	3.325+7½¢*ed*	3.325+7½¢*ed*	2.675+7½¢*ed*	1.95¢
New York	4.025+32¢	4.025+32¢	4.025+32¢	4.15+33¢	4.90+39¢	4.90+39¢*k*	4.15+33¢	4.15+33¢	4.15+21¢
Philadelphia	3.52+10	3.665+10	3.665+10	3.79+10	4.215+10	4.215+10	3.765+10	3.41+10	2.35
Pittsburgh	3.565+15¢	3.565+15¢	3.565+15¢	3.565+15¢	3.765+15¢	3.765+15¢	3.765+15¢	3.275+15¢	2.435+20¢
St. Louis	3.825	3.825	3.825	3.825	3.825	3.825	3.825	3.275	3.275
San Francisco	3.70+20¢	3.70+20¢	3.70+20¢	3.70+20¢	3.85+20¢	3.85+20¢	3.75+20¢	3.10+20¢	2.955+20¢
Seattle	3.56+20¢	3.56+20¢	3.56+20¢	3.56+20¢	3.93+20¢	3.93+20¢	3.65+20¢	3.29+20¢	3.20+10¢
Montreal	1.85+4¢*q*	2.08+5¢	2.08+5¢	2.08+5¢	2.35+5¢	2.35+5¢	2.08+5¢	1.95+4¢	1.95+4¢
Toronto	2.30+10¢	2.40+10¢	2.40+10¢	2.40+10¢	2.90+12¢	3.05+12¢	2.70+11¢	2.40+10¢	2.40+10¢

ENR Skilled Average (Bricklayers, Carpenters, Iron Workers): $3.95, ENR Common Average $2.635

Description of fringe benefits last appeared Feb. 26; will next appear in Sept. 17 Cost Issue. *A 1–2 drum. *R revised off. Jan. 1

DEFERRED WAGE INCREASES UNDER PRESENT CONTRACTS: 1960: a May 1; 10¢ b May 1; 12¢ k May 1; 8¢ l May 1; 10¢ m Jan. 1; 15¢ n Jul. 1; 5¢ o Jun. 30; 22½¢ s Apr. 1; 15¢ **1959:** c Dec. 1; 10¢ d Nov. 1; 10¢ e Nov. 1; 5¢.

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	Gypsum Plaster Board, tapered edge, per Msq ft: ½"	⅝"	Gypsum Board Lath, plain or perf, per Msq ft: ⅜" x 16" x 48"	Gypsum Sheathing, tongue & groove, per Msq ft: ½" x 2' x 8'	Fiber Board Sheathing, asph impreg & coat, per Msq ft: ½" sq ed	½" T&G	Fiber Board Insulation, sq edge, paint, per Msq ft: ½"	Mineral Wool Insulation: loose, per 40-lb bag	3" batts per M sf	Glass Fiber Insulation: loose, per 40-lb bag	3" batts per M sf	Aluminum Foil: 60# Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq ft
Atlanta	$65.00*F*	$55.00*F*	$42.50*F*	$68.00*F*	$72.00*F*	$127.00*F*	$75.00*F*	1.59*q*	$70.00*F*	$2.00	$80.00*F*	$4.77*qi*	
Baltimore	54.00	47.50	35.75	55.70	65.00	108.50	69.00	1.40*F*	67.50*F*	1.60*F*	47.00*F*	4.00*F*	$33.50*F*
Birmingham	68.90*H*	57.00*H*	47.77*H*	75.00*H*	67.50*H*	140.50*H*	83.50*H*	1.40	70.00	1.60	75.00	3.77*gG*	.....
Boston	60.00*mH*	50.00*mH*	35.00*mH*	55.00*mH*	65.00*H*	120.00*H*	79.00*knH*	1.40*bH*	75.00*H*	.....	75.00*H*	5.30*xHS*	53.50*qH*
Chicago	67.00	54.00	45.00	62.00	87.00	123.00	87.00	1.85	80.00	.....	63/65	5.25*fj*	.....
Cincinnati	52.50*wH*	42.85*wH*	33.05*wH*	51.16*wH*	77.00*wH*	125.00*wH*	72.50*wH*	1.45*wH*	62.50*wH*	1.45*wH*	62.50*wH*	3.28*fwJ*	50.00*wJ*
Cleveland	62.00*CF*	56.50*CF*	41.50*CF*	65.00*CF*	80.00*CF*	129.00*CF*	80.00*CF*	1.35/1.50*H*	73.00*H*	.....	63.75	12.50*ieJ*	55.00*J*
Dallas	56.25	46.85	42.50	56.25	68.75	118.00	68.75	2.00	68.69	1.45	70.67	5.00*gAG*	45.00
Denver	66.50*H*	58.50*H*	45.00*H*	68.75*H*	84.00*H*	130.00*H*	84.50	1.50*b*	65.00*nb*	1.75*b*	65.00*a*	5.25	48.65
Detroit	66.00*K*	56.00*K*	42.45*K*	66.00*K*	62.50*DK*	103.50*DK*	62.50*DK*	1.30*b*	50.00	1.95*b*	80.00	.....	.....
Kansas City	72.00*H*	62.00*H*	45.00*H*	.....	75.00*H*	122.00*H*	80.00*H*	1.40*H*	75.00*H*	1.80*H*	75.00*H*	3.60*d*	53.98
Los Angeles	66.00*F*	60.50*F*	0.33*xF*	64.50*F*	75.00*F*	125.00*F*	80.00*F*	76.00*BeF*	83.00*F*	1.35*s*	64.00	4.40*g*	7.45*V*
Minneapolis	75.00*F*	65.00*F*	0.41*xL*	75.00*F*	95.00*F*	130.00*F*	78.00*F*	2.25*yF*	80.00*F*	2.10*F*	80.00*F*	4.25*F*	.....
Montreal	58.00*M*	49.30*M*	37/41.50*M*	53.00*M*	64.75*M*	.....	58.50*M*	1.50*M*	66.00*M*	1.50*M*	66.00*M*	9.00*qM*	56.00*M*
New Orleans	57.00*H*	52.00*H*	45.00*H*	60.00*H*	67.00*H*	140.00*H*	80.00*H*	2.00*L*	70.00*	.....	.....	.....	52.12*U*
New York	65.00*H*	55.00*H*	42.50*H*	66.00*H*	78.00	124.00	78.00	1.55*b*	68.50*k*	.....	.....	4.38*iH*	40.00*eH*
Philadelphia	53.00	46.00	37.50	53.50	70.00	120.00	70.00	1.35	50.00	1.40	50.00	3.85	83.50
Pittsburgh	74.00*K*	65.00*K*	40.00*K*	63.00*K*	63.00*K*	103.35*K*	58.10*K*	1.10*sK*	55.00*K*	1.10*sK*	55.00*K*	4.20*iqK*	38.50*K*
St. Louis	65.00*HO*	55.00*HO*	40.00*HO*	70.00*HO*	76.00*HO*	120.00*HO*	80.00*HO*	1.35*yHO*	85.00*HO*	2.00*PHO*	74.00*HO*	4.50*iqHO*	.....
San Francisco	60.00*F*	49.00*F*	0.36*xF*	61.00*F*	70.00*F*	111.00*F*	69.00*F*	1.75*F*	66.50*F*	1.75*F*	66.50*F*	5.10	60.00*F*
Seattle	66.80*K*	57.65*K*	51.05*K*	65.00*K*	74.50*K*	125.00*K*	73.50*K*	1.15*tK*	58.00*K*	1.90**pK*	51.00**lKk*	4.25*K*	46.50*EK*
Toronto	58.00	50.00	45.00*L*	67.50	70.00*T*	.....	79.00*T*	1.85	72.00	.....	72.00	14.75*o*	46.00

° F.o.b. warehouse. *a Semi thick. *b 30# bag. *c 3 layers of foil: $54.50. *d 40# kraft paper, 5 Msf, 100/500 rolls. *e 20# sq ft bag, 4" thick. *f Full trailer loads. *g 80# kraft paper backing 400 rolls or over. *h LCL. *i 40#. *j 80#. *k 2-in. *l 2". *m 8 to 10 ton quantities. *n Distributor's siding. *o Per Msf roll. *p 32# bag. *q 500 sf. *s 35# bag. *t 28# bag *u Flame proof $75. *v 5000 sf quantity. *w F.o.b. city. *x Sq. yd. *y 30# bag. *z Spun rock wool. *A 650 sf. *B ton. *C F.o.b. plant, freight allowed. *D CL. *E 10 Msf. *F less 2% disc, 10th. *G ½ of 1%, 10 days. *H 2% disc, 10 days. *J 1% disc, 10 days. *K less 2% for cash. *L 5% disc, 10th mo. *M fed. tax incl. *N 1% disc, 10 days. *O add 2% sales tax. *P 50 lb. bags, *Q add 4% sales tax. *R revised. *S 45 lb. *T less 2%, 30 days. *U lots of 2606 sq. ft. *V 250 sf roll.

MEXICO CITY WAGES & PRICES

WAGES, av per week, 8 hr day (pesos)		Feb. '60
Common labor,	building (peons)	119.00
	heavy const (peons)	119.00
Skilled labor,	carpenters 1 cl	210.00
	bricklayers 1 cl	280.00
	struct. ironworkers	350.00

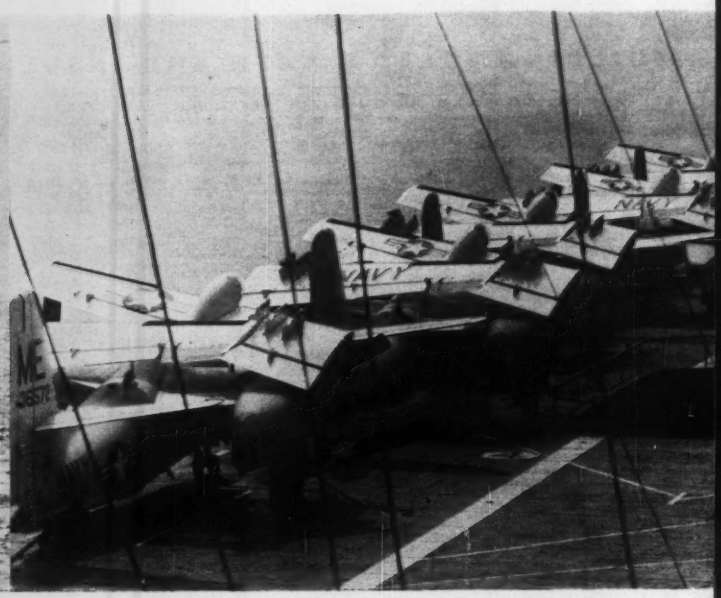
MATERIALS PRICES, F.o.b. City (pesos)		Feb. '60
Struct. steel shapes, fob Monterey		
I-beams, 3 x 3 x 4"	per metric ton	2500.00
Reinf. steel, corrugated rods, per ton		
⅜"-½" x 11 meters		1950.00
¾"-1" x 11 meters		1950.00

		Feb. '60
Gravel, truckload, per cu meter		
Blue gravel		30.00
Cement, std. port. (Tolteca)	per metric ton	250.00
Lumber, 2" x 4" 1st class pine	per M sq. ft.	2400.00
2" x 4" 2nd class pine	per M sq. ft.	2100.00

The story of Alfa and the Skunks—

An enemy might be able to hit any point in the United States with a missile fired from a submarine. To protect us, the Navy must patrol millions of square miles of open sea. Task Group ALFA trains for the task. Ships and planes probe the bottom of the seas in an eerie game of cat and mouse with sonar sets so delicate they must tell a school of snapping shrimp from a pack of enemy "skunks," as unknown submarines are called. Our anti-submariners depend on steel—carbon steel, high-strength low-alloy steel, ultra high-strength alloy steels, Stainless Steel,

With deadly patience, a helicopter hovers above a suspected submarine and lowers a sonobuoy into the water. Little larger than a football, the sonobuoy transmits any sound impulses from sub back to the helicopter, which can drop depth charges. The cable is specially designed multi-control electrical cable of steel and copper strands manufactured by the American Steel & Wire Division of U. S. Steel. It is the main artery of $1,000,000 worth of detection gear in the helicopter.

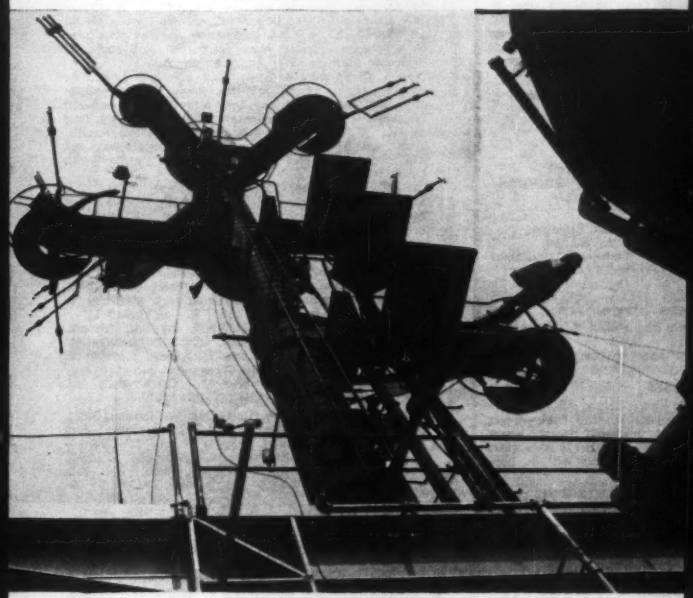


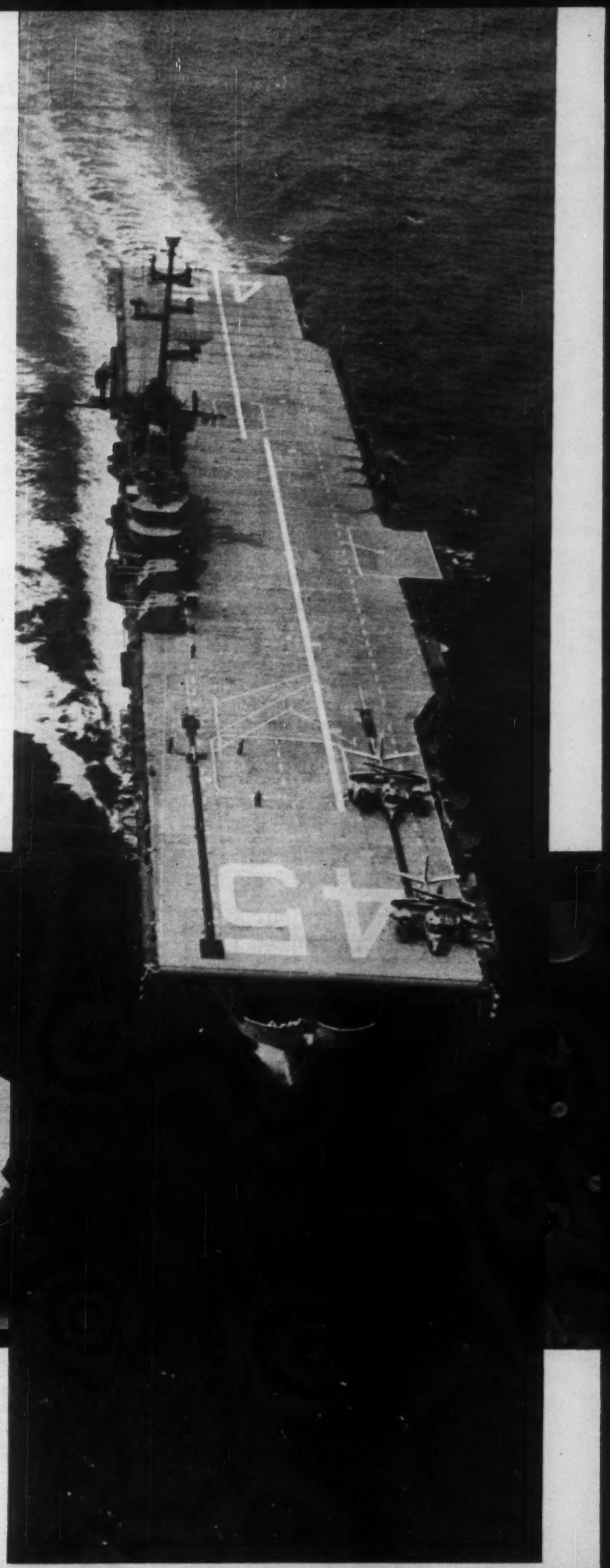
These S2F "Guardians" are ideal for long-range, all-weather operations. Engine pods hold sonobuoys; on the wings are seven-million-candlepower JULIE searchlights. It takes 78,000 tons of steel, counting the carrier and her supporting destroyers, to keep the task group's aircraft operating.

electrical cable, or wire rope. And United States Steel maintains the technical service to guide users in the proper use of these many steels and provide even better steels for the future. Before a program is ready for the drawing board consult with UNITED STATES STEEL.

USS United States Steel

TRADEMARK





CARRIER VALLEY FORGE's steel mainmast is a maze of electronic devices, including steel radar and radio antennas that keep her in constant touch with all elements of the task group. Her radio can reach around the world. She coordinates all attacks, and has been modified to handle anti-sub helicopters, S2F "Guardian" and AD "Skyraider" hunter-killer aircraft. Although not suited to handle modern Navy jets, VALLEY FORGE's life has been extended by modification to anti-sub work.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 7 Connecticut March 8 Massachusetts

March 11 Vermont

BUILDINGS—BA

▲† **Me., Topsham**—HOUSING—BA 3/22—Base Procurement Office, Topsham Air Force Station, Brunswick, 177 Capehart family housing units, Topsham Air Force Station, Inv. No. 17-612-60-2. $2,920,500. Plans deposit $200. Kelly & Gruzen, 10 Columbus Circle, New York 19, N. Y., archts. Herman Scherr, 18 John St., New York, N. Y., mechanical engr. CD 2/11.

BUILDINGS—LB & CA

▲ **Barber & Stevens, Inc.,** 36 Woodland St., Hartford, Conn., Owner Builds, **$3,500,000,** 250 HOUSES, water system, Old Colchester Rd., MONTVILLE, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 8 Maryland March 10 New Jersey

March 24 New York

▲ **N. J., Paramus**—BA 3/16—Borough of Paramus, Borough Hall, Stage I, sewerage system, $3,600,000. Malcolm Pirnie, 25 W. 43rd St., New York 36, N. Y., engr. CD 8/14/58.

▲ **N. Y., Valhalla**—QUARTERS FOR MEDICAL STAFF, etc.—BA 3/16—Dpt. P. Wks., Westchester Co., County Office Bldg., White Plains, Contr. 1110, general contract, Contr. 1110-P, plumbing work, Contr. 1110 H&V, heating and ventilating, Contr. 1110-E, electrical work for Quarters for Medical Staff, incl. medical education bldg., married staff quarters bldg., Grassland Hospital. Plans deposit $20.

HEAVY CONSTRUCTION—LB & CA

▲ **S. J. Groves & Sons Co.,** Court St. Rd., Syracuse, N. Y., LB **$2,626,997,** (4 bidders), 2 mi. Niagara Parkway section Bellewue Ave. to Devil's Hole State Park, Niagara Falls and Town of Lewiston, Niagara Co., Contr. No. N19, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Feb. 23. CD 2/4.

▲† **Gelco Builders & Burjay Constr. Co.,** 413 E. 119th St., New York 35, N. Y., LB **$2,198,552,** (11 bidders), installation central air-conditioning, U. S. Post Office and Annex, 33rd St. and 8th Ave. and U. S. Post Office, Morgan Annex, 341 9th Ave., Contr. IFB No. 00806, NEW YORK, N. Y. General Services Admin., 250 Hudson St., New York 13, N. Y. Bids Feb. 19. CD 1/29, under Public Buildings.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

George M. Brewster & Son, Inc., 275 W. Fort Lee Rd., Bogota, N. J., CA **$2,058,628,** interchange, Rte. 73 and Rte. 130, Pennsauken and Cinnaminson Twps., Camden and Burlington Counties. Bids Jan. 20, awarded Feb. 16. CD 1/25, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 2/19,

Pa.—**Booth & Flinn Co.,** 1942 Forbes Ave., Pittsburgh, Pa., LB **$3,491,270,** est. $6,500,000 (12 bidders), 14,709 ft. divided highway rein.-con., 36 in. wide each side medial area, 4 pairs alternate bridges, section of Delaware Expressway (Interstate). Proj. 824-1, Bensalem and Bristol Twps., Bucks Co., for Pa. Hy. & Bridge Auth.;

Pa.—**Weaver Coal & Constr. Co.,** 543 Locust Valley Rd., Greensburg, Pa., LB **$152,678,** est. $150,000 (14 bidders), 8,001 ft. cr. aggregate base highway with bit. surf. 20 ft. wide, L.R. 64209, 64082, North Huntingdon and Penn Twps., Westmoreland Co. CD 1/19.

▲† **Ambrose Augusterfer Corp.,** 247 East Ashmead St., Phila., Pa., LB **$2,389,000,** (9 bidders), air-conditioning 30th St. Post Office, PHILA., PA. General Services Admin., 250 Hudson St., New York, N. Y. Bids Feb. 18. CD 2/4.

▲ **C. J. Langenfelder & Son,** 8427 Pulaski Hy., Baltimore 21, Md., LB **$3,240,139** (8 bidders), Jones Falls Expressway, 29th St. to Union Ave., incl. section of Kewswick Rd. Bridge, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Feb. 24. CD 2/10.

▲ **John F. Casey,** P.O. Box 1888, Pittsburgh, Pa., CA **$2,498,518,** Washington Channel Bridge and substructure grading, WASH., D. C. D. C. Govt., Dpt. Highways, 499 Pa. Ave. N.W., Wash., D. C. Bids Feb. 10. CD 2/12, under LB.

BUILDINGS—LB & CA

▲ **Becker & Lipschutz,** 4417 N. Broad St., Phila., Pa., Separate Contracts, **$2,000,000,** 155 unit APARTMENT, 34 unit motel, Main St., DOYLESTOWN, N. J. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

▲ **Westinghouse Electric Corp.,** 3 Gateway Bldg., Pittsburgh, Pa., CA **$8,000,000,** ELEVATORS for Grand Central City Office, 200 Park Ave., NEW YORK, N. Y. Grand Central Bldg., Inc., 24 W. 58th St., New York, N. Y. CD 5/9/58, under CA.

▲ **Elliot B. Badanes,** 668 Brentwood Dr., South Orange, N. J., Owner Builds, **$2,200,000,** 95 HOUSES, Harris Ave., MIDDLESEX, N. J.

▲ **B. Bornstein & Son,** 2027 Arch St., Phila., Pa., LB **$2,319,500,** men's DORMITORY, PHILA., PA. Temple University, 1900 Park Ave., Phila., Pa. Severud-Elstad-Krueger Assocs., 415 Lexington Ave., New York, N. Y., engrs. CD 9/11/58.

▲† **McCloskey & Co.,** 1620 W. Thompson, Phila., Pa., LB **$50,793,000,** (7 bidders), superstructure for additional OFFICE BLDG. for U. S. House of Representatives, WASH., D. C. Office of the Architect of the Capitol, U. S. Capitol, Wash., D. C. Bids Feb. 18. CD 1/25.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 22 North Carolina

▲ **Miss., Jackson**—COLISEUM—BA 3/17—State Bldg. Comn., 1503 Woolfolk State Office Bldg., coliseum, State Fair Grounds. Plans deposit $100. Jones & Haas, 222 Plaza Bldg., archts. CD 9/25/58.

▲† **Alabama and Georgia**—BA 4/14—U. S. Eng., P.O. Box 1169, Mobile, Ala., Columbia Lock and Dam, Chattahoochee River, CIVENG-01-076-60-33B. $10,000,000. CD 9/29.

BUILDINGS—LB & CA

▲ **A. & G. Constr. Co.,** Forest City, N. C., CA Est. **$2,000,000** (3 bidders), cabinet PLANT, FOREST CITY, N. C. North Carolina Wooden Cabinet Display Co., sub. American Greetings Corp., 1300 W. 78th St., Cleveland, O. Joseph Ceruti & Assocs., 7113 Euclid Ave., Cleveland 3, O., archts. CD 1/19.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; Industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — Middle West
Middle Atlantic — West of Mississippi
South — Far West

PROPOSED WORK
Water Supply — Public Buildings
Sewers, Waste Disposal — Mass Housing
Bridges — Commercial Buildings
Streets & Roads — Industrial Buildings
Earthwork, Waterways — Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 15 Ohio

▲ **Ill., Chicago**—CONCOURSE BLDGS.—BA 3/31—Dpt. Purchases, City Hall, No. 80.85-60-113, RB-16, concourse bldgs., Chicago-O'Hare International Airport, $3,000,000. Naess & Murphy, 224 S. Michigan Ave., Chicago, Zone 4, engrs. CD 10/23.

BUILDINGS—SLC

▲ **Mich., Detroit**—FOUNDATIONS, etc.—Michigan Consolidated Gas Co., 415 Clifford St., Detroit, soon lets contract foundation and steel for 20 story, 400,000 sq. ft. office with underground garage, Jefferson, Griswold and Larned Sts. Total cost $20,000,000. Minoru Yamasaki, 1025 E. Maple Rd., Birmingham, archt. Smith, Hinchman & Grylls, 3107 W. Grand Blvd., Detroit, Zone 2, engrs. CD 11/26/58.

HEAVY CONSTRUCTION—LB & CA

▲ **INDIANA and KENTUCKY**—State Hy. Dpt., 102 N. Senate Ave., Indianapolis, Ind.,

R. C. Mahon Co., 6565 W. 8 Mile Rd., Detroit, Mich., CA **$5,394,929,** superstructure steel bridge over Ohio River, linked to Hy. No. 64 stretching from Richmond, Va. to St. Louis, Mo., Jefferson Co., Ky., and Floyd Co., Ind. Bids Jan. 26, awarded Feb. 17. CD 1/29, under LB.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., Midwest and 22nd St., Hinsdale, Bids opened 2/23,

Edward Gray Corp., 12233 S. Avenue O, and **Telander Brothers Contractors, Inc.,** 8151 S. Western St., both Chicago, Ill., LB **$5,060,436,** (2 bidders), three service stations, ESA-2, Downers Grove, DuPage Co.; NSA-4, Elgin, Kane Co. and TSA-1, Thornton Co. CD 2/19.

▲ **MICHIGAN**—State Hy. Dpt., Mason Bldg., Lansing, Bids opened 2/17,

Mich.—**L. A. Davidson,** 213 E. St. Joseph St., Lansing, Mich., LB **$2,193,565,** 3.5 mi. US as expressway and four structures from Bay City Midland Expressway (new M 20) north to existing US-23 in Kawkawlin, Bay Co.;

Mich.—**Canonie Constr. Co.,** M-43, South Haven, Mich., LB **$3,040,287,** 6.7 mi. expressway and five structures on US-12 expressway from Snow Rd. just south of Bridgman south to Easy Rd., Berrien Co.;

Mich.—**S. D. Solomon & Sons,** 3760 Elizabeth Lake Rd., Pontiac, Mich., LB **$1,519,460,** 2 mi. US-16 expressway and two structures and a rest area between Whitneyville Rd. and Thornapple River Dr., Kent Co.;

Mich.—**L. W. Edison,** 3134 Midland Dr., Grand Rapids, Mich., LB **$1,714,368,** 2 mi. US 16 expressway and two structures from Thornapple River westerly to 28th St., Kent Co.;

Mich.—**W. H. Knapp,** Box 593, Monroe, Mich., LB **$2,045,759,** 3.4 mi. dual 24 and 36 ft. roadways and two interchanges on relocated M-20 in Midland from Ellsworth St. easterly to US-10 expressway now under construction east of city, Midland Co.;

Mich.—**Cooke Contg. Co.,** 1116 Penobscot, Detroit, Mich., LB **$1,626,363,** 4.5 mi. single roadway and 3 structures on US-23 Saginaw Eastbelt from US-23 US-10 intersection south of Bridgeport northerly to M-46, Saginaw Co.;

Mich.—**Holloway Constr. Co.,** 29350 Joy Rd., Livonia, Mich., LB **$2,226,147,** 4.9 mi. US-12 expressway and six structures, dual bridge over Mill Creek 3.5 mi. SE of Chelsea; bridge over Mill Creek; dual structure over Danver Rd.; dual bridge over Mill Creek grade sep. over Parker Rd., Washtenaw Co. CD 1/28

▲† **Great Lakes Dredge & Dock Co.,** Williamson Bldg., Cleveland 14, O., CA **$2,473,080,** dredging work Fighting Island Channel, Detroit River, CIVENG-20-064-60-34, MICHIGAN and ONTARIO. U. S. Eng., 1101 Washington Blvd., Detroit 31, Mich. Bids Feb. 4, awarded Feb. 19. CD 2/12, under LB.

BUILDINGS—LB & CA

▲ **Turner Constr. Co.,** Gwynn Bldg., Cincinnati, O. CA Est. **$4,000,000,** 14 story APARTMENT, Madison St., CINCINNATI, O. Mayer I. Blum & Sons, c/o Milton Schwartz, archt., 10 S. 18th St., Phila, Pa.

▲ **Chell & Anderson, Inc.,** 5425 N. Kedzie St., Chicago, Ill., LB **$3,702,500,** (14 bidders), general contract Chicago TEACHERS COLLEGE, CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St. Chicago, Ill. Bids Feb. 23. CD 1/12.

▲ **Metropolitan Structures,** c/o H. S. Greenwald Estate, 135 S. La Salle St., Chicago, Ill., Owner Builds, **$4,000,000,** 14 story tower and 4 story exten., 285-room MOTEL, Michigan and 8th Sts., CHICAGO, ILL. A. Epstein & Sons, 2011 Pershing Rd., Chicago, Ill., engrs.

▲ **Kaiser Engineers, Div. Henry S. Kaiser Co.,** 1924 Broadway, Oakland, Calif., CA Est. **$3,000,000,** magnesia refractory PLANT, MIDLAND, MICH. Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif. CD 5/14.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 8 Iowa — March 15 Kansas
March 15, 16 Texas

STREETS AND ROADS

March 8 Iowa — March 15 Kansas
March 15, 16 Texas — March 24 Nebraska

▲† **South Dakota**—BA 4/14—U.S. Eng., 1709 Jackson St., Omaha 2, Neb., penstocks and surge tanks, near Pierre Oahe Reservoir Project, CIVENG-25-066-60-65. $10,000,000. CD 2/18.

▲† **South Dakota**—BA 4/30—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., furnishing, installing generators, near Fort Thompson Reservoir Project, Big Bend, CIVENG-25-066-60-48. $10,000,000. CD 9/29.

▲† **Arkansas**—BA 5/5—U.S. Eng., Gay Bldg., Little Rock, 1,200 ft. long Dardanelle Dam, Arkansas River, CIVENG-03-050-60-53, $9,500,000. Plans deposit $6.20. CD 9/28.

BUILDINGS—BA

▲ **Mo., St. Louis**—LIBRARY—BA 317—Washington University, Lindell and Skinker Blvds., Zone 30, 5 levels 218 x 218 ft., stone, masonry blocks, glass, concrete John Olin Library. $3,000,000. Murphy & Mackey, 6124 Enright Ave., Zone 12, archts. CD 5/18/56.

▲† **Okla., Fort Sill**—TRANSPORT—BA 3/23—U. S. Eng., Box 61, Tulsa, Zone 2, 96,000 sq. ft. masonry artillery transport bldg., 24,000 sq. ft. concrete hardstands, asphaltic concrete parking surface, tanks roads, utilities. $2,500,000. CD 9/8/58.

HEAVY CONSTRUCTION—LB & CA

▲ **Houston Contg. Co.,** 2807 Buffalo Speedway, Houston, Tex., CA Est. **$6,705,000,** 149 mi. 30 in. gas line Corona to McCartys; CA Est. **$6,035,000,** 55 mi. 30 in. and 89 mi. 24 in. gas line, Corona to Roswell, N. M. and to Carlsbad, N. M.; CA Est. **$6,972,000,** 166 mi. 24 in. gas line, Roswell, N. M. to Dawn, Tex.; CA Est. **$3,600,000,** 200 mi. 10- to 16-in. pipe gas line laterals, Dawn, Tex. area, and Roswell, N. M. area; CA Est. **$4,412,000,** 61 mi., 20 in. and 76 mi. 24 in. lines Fort Stockton, Tex. to Carlsbad, N. M., TEXAS and NEW MEXICO. Transwestern Pipeline Co., First City National Bank Bldg., Houston, Tex. Grand total est. $29,324,000. CD 12/23/58, under Texas, New Mexico and Arizona; **Western Pipeline, Inc.,** VFW Bldg., Austin, Tex., CA Est. **$1,600,000,** 100 mi., 10 to 16-in. gas line laterals, Fort Stockton area, and Carlsbad, N. M. area, (Texas and New Mexico).

▲ **TEXAS**—State Hy. Comn., Austin, Bids opened 2/17, Tex.—**Cecil Ruby Co., Inc.,** Brown Bldg., Austin, Tex., LB **$2,364,113,** grading, structures, flex. base, hot mix b. conc. 1.736 mi. Hy. IH 35 Proj. I 35-3 (9), Travis Co.; LB **$171,548,** grading structures, base, surf. 12.197 mi. Hy. F.M. 65 Proj. S 66 (5), Zavalla and Dimmit Counties, CD 1/21; LB **$915,054,** grading, structures, base, b. conc. 12.501 mi. Hy. U.S. 87 Proj. F 631 (12) Kendall and Kerr Counties, CD 1/28; Tex.—**Trinity Constr. Co., Inc.,** P.O. Box 3024, Houston, Tex., LB **$1,039,194,** grading, storm sewer, shell concrete base, b. conc. pavement 0.62 mi. Hy. IH 10, Proj. I 10-7 (68) and (43), Harris Co.

▲ **A. O. Smith Corp.,** 35-33 N. 27th St., Milwaukee, Wis., CA Est. **$25,000,000,** furnishing 600 mi. 16- to 30-in. pipe for main natural gas line from Harper Co., Okla. to Wisconsin and Michigan, OKLAHOMA-KANSAS-MISSOURI, IOWA, ILLINOIS and MICHIGAN. Michigan-Wisconsin Pipe Line Co., 500 Griswold St., Detroit 26, Mich. CD 1/30.

▲ **R. H. Fulton & Co.,** 2323 Erskine Rd., Lubbock, Tex., CA approx. **$10,980,000,** 244 mi. natural gas, 30 in. pipe, Permian-San Juan line loops, San Juan, NEW MEXICO, El Paso Natural Gas Co., Bassett Tower, El Paso, Tex. CD 1/11/56.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 23, 24 California

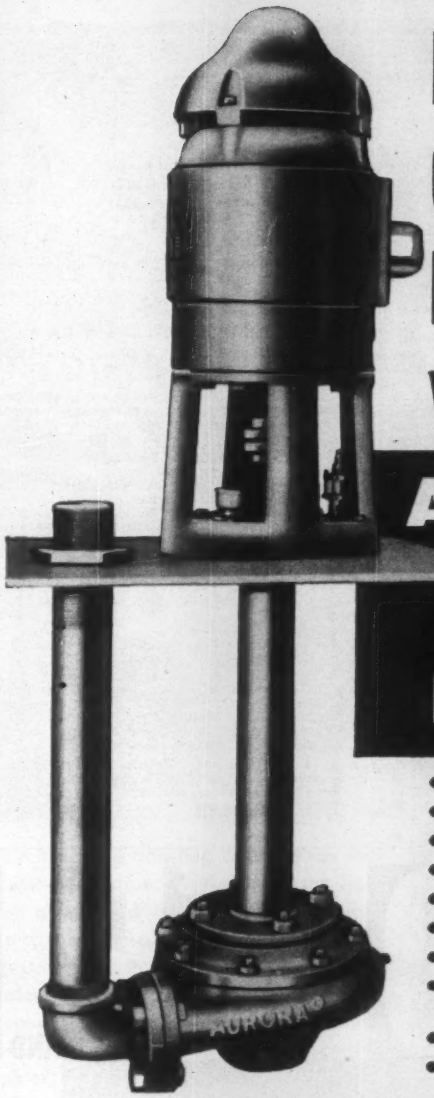
BUILDINGS—BA

▲ **Calif., Los Altos** — COLLEGE — BA 3/29 — Foothill Junior College Dist. Santa Clara Co., 150 El Camino Real, Mt. View, Foothill College, El Monte Rd. and Purissima Ave. $10,400,000. Plans deposit $200. Ernest J. Kump and Masten Hurd & Gwathmey, 526 Powell St., San Francisco, archts. CD 1/6.

HEAVY CONSTRUCTION—LB & CA

▲† **M-B Constructing Co., Inc.,** Lloyd Bldg., Seattle 1, Wash., CA **$2,859,151,** support facilities and communications at Clear Air Force Station for Alaskan Air Command, Inv. 60-23, CLEAR, ALASKA. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids Feb. 11. CD 2/18, under LB, Alaska.

▲† **Raber-Kief, Inc.,** 5939 4 Ave. S., Seattle, Wash., CA **$2,420,129,** est. $2,279,225, air defense facilities, Mountain Home Air Force Base, ENG-45-164-60-22,



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MOUNTAIN HOME, IDAHO. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 9. CD 2/11, under LB.

▲ **H. C. Price Co.**, Bartlesville, Okla., CA Est. **$13,050,000**, 335 mi. main gas line spreads, Topock East, ARIZONA. Transwestern Pipeline Co., First City National Bank Bldg., Houston, Tex. CD 11/30, under Texas, New Mexico and Arizona.

▲ **Hood Contracting Co.**, Box 2095, Boise, Idaho, CA Est. **$10,595,000**, constr. 125 mi. gas line from Eugene, Ore. to Camas, Wash., OREGON and WASHINGTON. El Paso Natural Gas Co., El Paso Natural Gas Co. Bldg., El Paso, Tex. Awarded Feb. 16.

▲ **Young & Anderson Co.**, 650 Berry St., Brea, Calif., CA section 115 mi. 36 in. natural gas pipe line from Newbury to foot Canyon Pass near Fontana, CALIFORNIA. Southern California Gas Co. and Southern Counties Gas Co., 810 S. Flower St., Los Angeles, Calif. Total est. **$19,000,000**;
Hood Constr. Co., 8201 S. Sorensen Ave., Whittier, Calif., and **J. P. Neill, Inc.**, Meadows Bldg., Dallas, Tex., CA section from Fontana to Placentia (California).

▲† **White Diesel Engine Div. of White Motor Co.**, 1401 Sheridan St., Springfield, O., LB **$4,797,720** (5 bidders), Sched. A, furnish electrical generator sets for Ballistic Missile Operational and Test Facilities at Vandenburg Air Force Base, Lompoc, Calif., Schilling Air Force Base, Salina, Kan., Lincoln Air Force Base, Lincoln, Neb., Altus Air Force Base, Altus, Okla., Dyess Air Force Base, Abilene, Tex., Walker Air Force Base, Roswell, N. M., Plattsburgh Air Force Base, Plattsburgh, N. Y., ENG-23-028-60-39, CALIFORNIA. U.S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. Bids Feb. 9.

▲† **Ralph T. Viola and M & T Concrete, Inc., 1628** Pine St., Oxnard, Calif., LB **$4,740,000**, (13 bidders), missile project bldg., test project bldg. and addns. to instrumentation bldg., Spec. 24662-59, POINT MUGU, CALIF Dist. P. Wks. Office, Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Feb. 19, CD 2/12.

BUILDINGS—LB & CA

▲ **Western-Knapp Engineering Co.**, 650 5th St., San Francisco 7, Calif., CA Total est. **$40,000,000**, design and construct 15,000 ton per day COPPER FLOTATION CONCENTRATOR, Mission Project, TUCSON, ARIZ. American Smelting & Refining Co., 120 Broadway, New York, N. Y. CD 10/13.

▲ **M. J. Kuney Co.**, N. 120 Ralph St., Spokane, Wash., LB Est. **$2,000,000**, (9 bidders), 2 story, bsmnt., 223,000 sq. ft. rein.-con., masonry DEPARTMENT STORE, SPOKANE, WASH. Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill. Bids Feb. 18. CD 1/27.

▲ **Fred S. Macomber**, 8818 Melrose Ave., Los Angeles, Calif., LB **$2,162,000**, (13 bidders), TUBERCULAR SEGREGATION and RECALCITRANT UNIT, Mira Loma Facility, Lancaster, LOS ANGELES, CALIF. Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, Calif. Bids Feb. 24. CD 1/29.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 23 Ontario

BUILDINGS—BA

▲ **Alta., Calgary**—SCHOOL—BA 3/18—Calgary Public School Bd., 4th Ave. and 6th St. W., 32-room school, Elbow Dr. and 7th Ave., $2,750,000. J. Stevenson & Assoc., 344 12th Ave. S.W., archts. CD 2/9.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria, Bids opened 2/17,
Dominion Bridge Co., Ltd., 2450 Boundary Rd., Burnaby, B. C., LB **$6,894,287**, fabrication and erection structural steelwork for main superstructure, Port Mann Fraser River Bridge, Port Mann. CD 2/5.

▲ **McNamara Constr. Co. Ltd.**, 42 Industrial St., Toronto, Ont., CA **$3,666,470** (5 bidders), excavating about 1,363 cu. yd. material from area extending downstream approx. 5,000 ft. both sides of international boundary, St. Lawrence Seaway and Power development, Cornwall, ONTARIO. Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, Ont. Bids Feb. 9. CD 1/15.

BUILDINGS—LB & CA

▲ **Bird Constr. Co. Ltd.**, 1427 19th Ave. E, Calgary, Alta., CA **$2,408,648**, 200 bed CONVALESCENT WING HOSPITAL addn., Calgary General Hospital, CALGARY, ALTA. City, City Hall, Calgary, Alta. Bids Jan. 15, awarded Feb. 17. CD 2/8, under LB.

▲ **Dawson & Hall Ltd.**, 775 Clarke Dr., Vancouver, B. C., CA **$2,767,425**, est. $2,600,000, 3 story, 50x200 ft., 3 story, 50x225 ft., 4 story, 50x130 ft. bsmnt., rein.-con. MEDICAL SCIENCES BLDG., University of British Columbia, VANCOUVER, B. C. Dpt. P. Wks., Parliament Bldgs., Victoria, B. C. Bids Jan. 28, awarded Feb. 15. CD 2/5, under LB.

▲ **J. A. Jones Constr. (Canada) Ltd.**, Stephenville, Newfoundland LB **$2,978,700** (14 bidders), 3 story, bsmnt., 210x406 ft. structural steel, brick, block, stucco walls National Research Council APPLIED PHYSICS LABORATORY, 1 story, part bsmnt., 59x158 ft. and 43x83 ft. building, incl. penthouse, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Feb. 17. CD 1/4.

▲ **Desaulniers Constr. Ltd.**, 339 Comte St., LaSalle, Que., CA Est. **$4,000,000**, 11 story, rein.-con. frame, stone, brick HOSPITAL, MONTREAL, QUE. Hospital Fleury Inc., 2198 Fleury St. E., Montreal, Que. Roux & Morin, 0119 Clement St., LaSalle, Que., archts. Jean F. Gagnon & Jean Horvath, 332 Craig St. E., Montreal, Que., engrs.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲ **TURKEY**—BA 5/16—General Director of Hys., State Hy. Dpt., Ankara,
Bosphorus Suspension Bridge 1,358 meters long with 942 meters between spans, Istanbul. $50,000,000. H. B. Steinman, Boynton, Gronquist & London, 117 Liberty St., New York 6, N. Y., U. S. A., engrs. CD 2/11.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Calif., Linda**—Linda County Water Dist., Hy. 99 E., voted **$1,950,000** bonds, sewerage sys. and sewage treatment plant. CD 7/31.

▲ **Fla., Lakeland**—City, City Hall, sanitary sewer extens. **$4,250,000**. Reynolds, Smith & Hills, P.O. Box 4817, Jacksonville, consult. engrs.

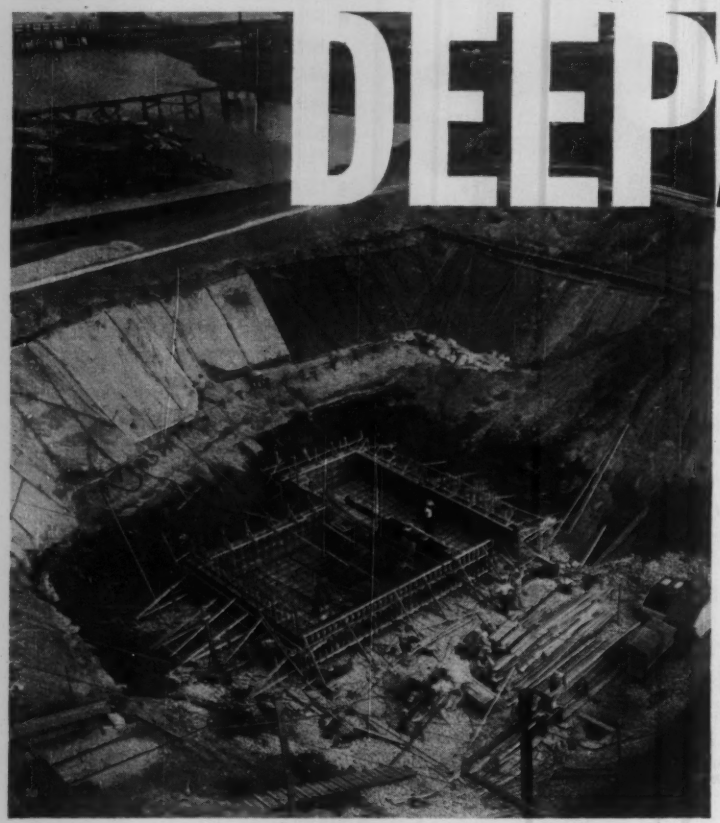
▲ **Pa., West Chester**—West Goshen Twp., sewerage system and sewage treatment plant, **$2,225,000**. Glace & Glace, 2771 Paxton St., Harrisburg, engrs. Bids in 3 months.

▲ **Tex., Amarillo**—City, City Hall, sewage treatment facilities and outfall sewers. **$5,500,000**. Freese Nichols & Endress, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 2/27/59.

BRIDGES

▲ **Ill., Dolton**—Chicago & Western Indiana R. R., A. B. Hillman, ch. engr., 47 W. Polk St., Chicago, Zone 5, 270 ft. double track truss span bridge, underpass, over Cal-Sag channel, 134th St. **$2,400,000**. Bids in 1962. Alfred Benesch & Assocs., 10 S. Wabash Ave., Chicago, Zone 3, consult. engrs.

▲ **Ill., Riverdale**—Pennsylvania R. R., C. H. Henry, ch. engr., Transportation Center, 6 Penn Center Plaza, Phila. 4, Pa., 270 ft. span, double track truss bridge reconstr. over Cal-Sag channel, **$1,800,000**. Bids in



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1962. Alfred Benesch & Assocs., 10 S. Wabash Ave., Chicago, Zone 3, consult. engrs.

▲ **WASHINGTON-OREGON** — Washington Toll Bridge Auth., Olympia, Wash., bridge over Columbia River from Camas-Washougal area via Government Island to Oregon shore, **$6,000,000** (not financed).

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., 1,900 ft. long, 72 ft. wide overpass,, Jane St., $1,500,000. Laughlin, Wyllie & Ufnal, 53 Kipling Ave. S., New Toronto, consult. engrs.; grade separation and interchange, Kipling, Dundas and Bloor Sts., $1,300,000, Foundation of Canada Engineering Corp., 8 Spadina Rd., consult. engrs.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 24 Wolcott Hill Rd., Wethersfield,

Cromwell and Middletown—Interstate Rte. 91 from Preston Ave. at Meriden-Middletown Line to 4,000 ft. N.E. of Rte. 72, Cromwell, 5.4 mi. **$6,000,000.** John J. Mozzochi & Assocs., 217 Hebron Ave., Glastonbury, consult. engrs.

Cromwell and Rocky Hill—Interstate Rte. 91 from 4,000 ft. N.E. Rte. 72, Cromwell, to 700 ft. S.W. of Silbert Ave., Rocky Hill, **$4,000,000.**

▲ **Fla., Miami**—Dade County Courthouse, **$46,000,000** bond election May 3, expressway and road imprvs.

▲ **Ill., Chicago**—Dpt. Purchases, City Hall, Zone 2, grade and pave South Rte. Expressway, 28th Place to Stewart Ave., **$4,500,000;** grade and pave South Rte. Expressway, Canal St. to river, **$6,400,000;** grade and pave South Rte. Expressway, Stewart Ave. to Canal St., **$1,250,000,** CD 6/21/57; wid'n., resurf. Cicero Ave., 63rd to 73rd Sts., bridge over Belt Railroad, **$2,225,000.** Bids in 1961. Alfred Benesch & Assocs., 10 S. Wabash Ave., Chicago, Zone 3, consult. engrs.

▲ **MINNESOTA**—State Hy. Dpt., State Hy. Bldg., St. Paul, Zone 1,

Carlton Co.—6 mi. grading, base, 7 bridges, Interstate Rte. 35, **$3,167,000.**

Hennepin Co.—10 mi. grading, subbase, 7.5 mi. surf., 37 bridges FAI roads, **$18,498,000.**

Ramsey Co.—5 mi. grading, subbase, 7 mi. surf. 22 bridges FAI roads, **$11,759,000.**

Rice Co.—4.9 mi. grading, subbase, 10 mi. base and surf., 2 bridges Interstate 35, **$3,000,000.**

St. Louis Co.—1.5 mi. grading, subbase, 9 bridges Interstate Rte. 536, Duluth, **$5,475,000.**

Winona Co.—5.7 mi. grading, subbase, 12 bridges Interstate Rte. 90, **$3,545,000.**

▲ **NEBRASKA**—State Dpt. Rds., State House, Lincoln,

Hall and Buffalo Counties—grading, structures and paving between Grand Island and Kearney. **$10,000,000.** Constr. in 1961.

Hall Co.—interstate highway west from Grand Island. **$11,000,000-$12,000,000.** Constr. in 1960 and 1961.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Allegheny Co.—extension Penn-Lincoln Parkway (Interstate FAI **$14,000,000.**

Bedford Co.—4-lane divided highway between Deneens Gap and Breezewood Interchange of Pa. Turnpike, Rte. 126 (Interstate) FAI, **$9,300,000.**

Delaware and Philadelphia Counties—4-lane divided highway between cities of Chester, Delaware Co. and Phila., connecting with Penrose Ave. (Interstate) FAI, **$45,375,000.**

Lackawanna Co.—Dunmore Interchange U.S. Rte. 611 (Interstate) FAI, **$3,000,000.**

Philadelphia Co.—Penrose Ave., Packer Ave. and 26 St. to link rebuilt Industrial Highway with Schuylkill Expressway (Interstate) FAI, **$3,000,000.** W. R. B. Froehlich c/o owner, ch. engr.

▲ **PENNSYLVANIA**—State Hy. Dpt., 906 North Office Bldg., Harrisburg,

Allegheny Co.—Crosstown Boulevard an urban expressway project, **$45,000,000.**

Berks Co.—Turnpike feeder spur for city of Reading, between Reading and Morgantown interchange of Penn Turnpike (Interstate) **$15,000,000.**

Dauphin Co.—completion Harrisburg north-south bypass between village of Progess and Dauphin Boro (Interstate) **$8,500,000.**

Erie, Crawford, Mercer, Butler, Allegheny, Washington and Green Counties—Erie-West Virginia expressway (Interstate) **$150,000,000.**

Northampton Co.—Easton by-pass for U. S. Rte. 22 (Interstate), **$5,000,000.** F. S. Poorman, c/o owner, ch. engr.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison,

Milwaukee Co.—grade, pave and drainage work, Milwaukee Expressway, vicinity Glendale Ave., **$750,000.**

Ramp C, Milwaukee Expressway, **$230,000.**

Ramp Bridges F and K, Milwaukee Expressway, N.S. Proj. No. 3, **$300,000.**

viaduct over Milwaukee Railroad yards, Milwaukee Expressway, **$2,200,000.**

grade, paving and drainage work, Milwaukee Expressway, Keefe to Glendale Aves., **$1,300,000.** Bids this year. Alfred Benesch & Assocs., 10 S. Wabash Ave., Chicago 3, Ill., consult. engrs.

EARTHWORK, WATERWAYS

▲ **Connecticut**—Electric Power, Inc., Berlin, has been permitted by FPCT to withdraw application for license to construct Enfield Rapids hydroelectric project on Connecticut River. **$27,000,000.** Project abandoned. CD 5/2/57.

▲ **Conn., West Hartford**—Town, Town Hall, flood control, Trout Brook, S. Branch of Trout Brook, pipe line Thomson Rd. to Meadowbrook Rd. **$4,000,000.** Metcalf

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GENERAL INFORMATION

Job Location . . . Zanesville Interceptor Sewer Zanesville, Ohio

Engineer . . . . . Floyd G. Browne & Associates, Marion, Ohio

Contractor . . . . Roger Au & Sons Mansfield, Ohio

Materials . . . . . 15,000 Ft. V.C. Pipe, A.S.T.M. C-13 with Presto-SEAL joints, 6" to 24" diameter inclusive.

TEST DATA

Date of Test . . . . . June 18, 1959
Size of Line . . . . . 24" V.C. Pipe
Length of Line . . . . . 250 Ft.
Type of Test . . . . . Exfiltration
Allowable Loss . . . . . 500 Gal/In/Mi/day

RESULTS

After line was filled only 90 min., loss was approx. 1/3 the allowable.

*T.M. Reg.

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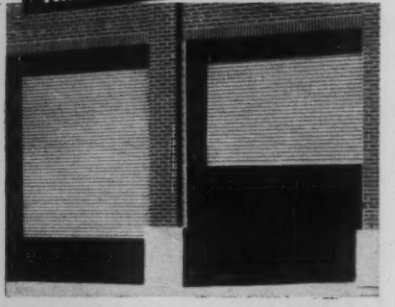

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& Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. Everett R. Kennedy, Dir. P. Wks.

AIRPORTS

▲ **Ala., Birmingham**—AIR TERMINAL—City, City Hall, 90,000 sq. ft. Municipal Airport air terminal, $2,000,000. Rader & Assocs., First National Bank Bldg., Miami, Fla., consult. engrs. CD 5/19/56.

▲ **N. Y., Idlewild**—RUNWAY EXTENSIONS—Port of New York Authority, 111 8th Ave., New York, Zone 11, 41,150 ft. extension Runway 4L-22R, $9,700,000; 1,400 ft. extension Runway 13R-31L, New York International Airport, $687,950. CD 8/20.

▲ **O., Cleveland**—RUNWAY, etc.—City, Port Control, City Hall, Zone 14, second parallel east-west runway and taxiway, Cleveland Hopkins Airport, $4,000,000; cargo taxiway and apron and holding apron, Cleveland Hopkins Airport, $2,000,000. CD 3/14/52.

▲ **Wash., Seattle**—AIRPORT IMPRVS.—Port of Seattle, Bell St. Terminal, Zone 1, grading, filling and concrete paving 150 x 1,700 ft. runway extension, Seattle-Tacoma International Airport, $2,800,000, Bids this year for first $800,000 unit; underpass to carry S. 188th St. under runway extension, $1,000,000, Bids this year. G. T. Treadwell, c/o owner, ch. engr.

FOREIGN

▲ **Austria, Vienna**—HOTEL, etc.—General Hotel Co. of Austria, Vienna, plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Ill., U.S.A., and Prof. Karl Appel and Dr. Walter Jaeksch, Vienna, Austria, 13 story, air-conditioned hotel, garage, skating rink, Johannesgasse, Heumarkt and Lothringerstrasse. $10,000,000. Intercontinental Hotels Corp., New York, N. Y., U.S.A., will operate.

▲ **Morocco, Casablanca**—ASSEMBLY PLANT—Somaca (Societe' Marocaine Automobile) Casablanca, assembly plant. $2,400,000.

U. S. POSSESSIONS

▲† **Panama Canal Zone**—Panama Canal Co., Canal Zone, Balboa Heights, deepening Panama Canal from 42 to 47 ft., and 300 to 500 ft. wide. $21,000,000.

AMERICANS ABROAD

▲ **India, Trombay**—RADIATION LABORATORY—Govt. of India, New Delhi, high level radiation laboratory at India Atomic Energy Dept. Nuclear Center. $4,000,000. Edward D. Stone, 38 E. 65th St., New York 21, N. Y., U.S.A., consult. archt. Vitro International, 261 Madison Ave., New York 16, N. Y., U.S.A., engrs. CD 9/17, under India.

PUBLIC BUILDINGS

▲ **Calif., San Jose**—SCHOOLS—Alum Rock Elementary School District, 149 N. White Rd., voted $1,750,000 bonds Feb. 9 and approval for $7,500,000 state loan for schools. CD 6/3/57.

▲ **Calif., San Jose** — SCHOOLS — Eastside Union High School District, 57 N. White Rd., voted $17,000,000 bonds Feb. 9 and $9,000,000 state aid for schools. CD 1/13.

▲ **Calif., San Jose** — SCHOOLS — Mount Pleasant Elementary School District, 14275 Candler Ave., voted $1,000,000 bonds Feb. 9 and $2,500,000 approval of state loan for schools. CD 5/4/56.

▲ **Ill., Danville**—HIGH SCHOOLS—Bd. Educ. School Dist. No. 118, 202 E. Fairchild St., three Junior High Schools. $4,000,000. Danville Associated Architects, 20½ W. North St., Danville, and Perkins & Will, 309 W. Jackson Blvd., Chicago, archts. CD 3/17.

▲ **Mo., Ladue (St. Louis 24 P.O.)**—SCHOOLS—Bd. Educ. School Dist. of Ladue, 1201 S. Warson Rd., Zone 24, voted $3,300,000 bonds Feb. 9, Junior High School, Ladue and Graeser Rds., Senior High School addn., 1201 S. Warsen Rd. and two elementary schools. CD 1/15.

▲ **Mo., Riverview Gardens (St. Louis 36, P.O.)**—SCHOOLS—School Dist. of Riverview Gardens, Bd. Educ., 1912 Chambers Rd., Zone 36, voted $2,085,000 bonds Feb. 9, Junior High School, over $400,000; and Senior High School and Lemaster and Thomas elementary school addns. Manske & Dieckmann, 9945 Riverview Dr., St. Louis, Zone 36, archts. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10th St., St. Louis, Zone 1, assoc. archt. CD 1/7.

▲ **Mo., St. Louis**—SCHOOLS—Bd. Educ., 911 Locust St., Zone 1, $24,297,239 bond election Mar. 22, schools. $26,000,000. CD 5/31/55.

▲ **N. J., Point Pleasant**—HIGH SCHOOL—Bd. Educ., project and bonds to be submitted to referendum Mar. 15, high school. $2,800,000. Boyken & Moss, 90 Bayard St., New Brunswick, archts. CD 7/23.

▲ **N. Y., Grand Island**—HIGH SCHOOL—Grand Island Central School Dist. No. 1 plans by Pfohl, Stoll & Roberts, 185 Niagara St., Buffalo, high school. $2,750,000. CD 3/13.

▲ **O., Akron** — MENTAL HOSPITAL — State Dpt. P. Wks., State Depts. Bldg., Columbus, Zone 15, 500-bed mental hospital, Romig Rd., for Dpt. Mental Hygiene & Correction. Over $7,000,000. CD 7/14/57.

▲ **O., Warrensville Heights**—HOSPITAL—State Dpt. P. Wks., State Depts. Bldg., Columbus, Zone 15, 500-bed mental hospital, Green Rd., Cooley Farm Property, for Dpt. Mental Hygiene & Correction. Over $7,000,000.

▲ **Wis., Sheboygan**—HIGH SCHOOL—Bd. Educ. plans by Bradley & Bradley, 824 N. Main St., Rockford, Ill., high school, $3,300,000. Bids about Mar. 15. CD 7/1.

COMMERCIAL BUILDINGS

▲ **Ala., Huntsville**—SHOPPING CENTER—Engel Corp., 1921 1 Ave. N., Birmingham, plans by Stevens & Wilkinson, archts. and engrs., 157 Luckie N.W., Atlanta, Ga., shopping center $2,500,000. CD 9/3.

▲ **Ariz., Tucson**—OFFICE—Stone-Council Investments, Ltd., c/o Blanton & Cole, archts., 211 W. Pennington, 12 story office, Stone Ave. and Council, $2,500,000.

▲ **Calif., Albany**—APARTMENT—Golden Gate Heights Co., 400 Montgomery St., San Francisco, plans by Robert Batchelor, 341 Embarcadero, San Francisco, 23 apartments, Albany Hill Area. $2,500,000.

▲ **Calif., Daly City**—APARTMENTS—Callan Realty Co., 2790 Junipero Serra Blvd., plans by Mogens Mogensen, 1424 Chapin Ave., Burlingame, seven 3 story, rein.-con., wood frame 328 apartments, incl. under parking, St Francis Heights Subdivision near Broadmoor Subdivision. $4,000,000. CD 4/23/56.

▲ **Calif., Mill Valley**—SHOPPING CENTER—Herb H. Shapiro, 391 Miller Ave., shopping center, Camino Alto. $3,500,000.

▲ **Calif., San Francisco**—APARTMENT—Joseph Greenbach, Jr., c/o Barbachano, Ivanitsky & Watanabe, archts., 11465 San Pablo St., El Cerrito, 22 story apartment, Russian Hill. $3,000,000.

▲ **Calif., Santa Clara**—SHOPPING CENTER—United California Theatres, Inc., 172 Golden Gate Ave., San Francisco, Plans by Skidmore & McWilliams, 901 Third St., San Francisco, 182,000 sq. ft. total floor space shopping center incl. 40 lane bowling alley, etc., El Camino Real and Kiely Blvd. $2,500,000.

▲ **Calif., Vallejo**—SHOPPING CENTER—Larwin Fund, 8692 Wilshire Blvd., Beverly Hills, Calif., 400,000 sq. ft. Vallejo Plaza Shopping Center, 4,000 car parking. $7,000,000. Novikoff Engineers, 3858 W. Santa Barbara, Los Angeles, consult. engrs.

▲ **Hawaii, Honolulu**—HOTEL-CHURCH—Evangelical Lutheran Church, Kaiulani and Kda Aves., 13 story hotel-church. $2,500,000.

▲ **Ill., Kankakee**—HOSPITAL AND RETIREMENT HOME, Stewards Foundation, 127 S. Wacker Dr., Chicago, plans by Samuel I. Oshiver & Assocs., archt.-consult. engrs., 1425 Walnut St., Pa., hospital and retirement home, $4,000,000.

▲ **Ky., Louisville**—CHILDREN'S HOME, etc.—German Protestant Orphans Home, 1260 Bardstown Rd., Zone 4, plans by Braun & Ryan, Heyburn Bldg., Zone 2, brick, rein.-con. children's home, to incl. 2 story 36x194 ft. administration bldg., 1 story dormitory, Watterson Expressway and Goldsmith Lane. Over $5,000,000.

▲ **Md., Glen Burnie**—HOSPITAL—North Arundel Hospital Assoc., 110 Crain Hy. N., plans by Wheeler, Bonn, Shockey & Assocs., 100 Roesler Rd., 4 story, 245x386 ft. brick, steel concrete hospital, near here. $3,000,000. Turpin, Wachter & Assocs., 1004 N. Charles St., Baltimore, mechanical engrs (Correction-name of mechanical engineers). CD 1/21.

▲ **Mo., St. Louis**—HOME FOR AGED—Jewish Orthodox Old Folks Home, 1438 East Grand Ave., Zone 7, plans by Shapiro & Tisdale, 705 Chestnut St., Zone 1, 5 story, 110 unit for chronically ill and 80 staff members. $2,000,000. CD 3/25.

▲ **N. J., Sayreville**—HOUSES—Morgan Development & Investment Co., P.O. Box 188, Iselin, 1,350 houses, Ernston Rd. and Cheesequake Creek, $20,000,000.

▲ **N. J., Woodbury**—HOSPITAL EXPANSION—Underwood Hospital, 509 N. Broad St., plans by Harbeson, Hough, Livingston & Larson, 117 S. 17 St., Phila., Pa., hospital expansion. Over $2,500,000. CD 12/4.

▲ **O., Bedford Heights** — HOMES, GARDEN TYPE APARTMENTS—Metropolitan Park Estates, 300 Bremerton Rd., Cleveland, Zone 24, 380 homes, 2 story, 150 unit garden type apartments, $10,000,000.

▲ **O., Cleveland**—ADMINISTRATION, etc.—Fenn College, E. 24th St., and Euclid Ave., Zone 15, plans by Joseph Ceruti, 7113 Euclid Ave., Zone 3, administration bldg., $7,000,000-$8,000,000; two classrooms, over $1,000,000; mens dormitory, $1,400,000, bids in October; third mens dormitory, $1,400,000; mens dormitory, $1,400,000, constr. several years away. CD 3/4/59.

▲ **O., North Madison**—SHOPPING CENTER—CIRD, Inc., c/o Ronald E. Mitchell, Madison on the Lake, plans by Robert R. Jenks, 1426 W. 50 St. Terrace, Kansas City, Mo., 65-unit shopping center, north side Rte. 20 west of Bennett Rd. to be known as North Ridge Plaza. $7,000,000. CD 7/30.

▲ **O., Twinsburg**—HOMES—Squires Constr. Co., 2224 Fairhill Rd., Cleveland 8, O., 300 HOMES near Reminderville, $4,800,000.

▲ **Pa., Germantown**—APARTMENT—J. P. Lieberman, 26 Court St., Brooklyn, N. Y., apartment, School House Lane, $3,000,000. Samuel I. Oshiver & Assocs., 1425 Walnut St., Phila, Zone 3, archts.—consult. engrs.

▲ **Pa., Phila.**—APARTMENTS—2401 Pennsylvania Avenue Corp., c/o Samuel I Oshiver & Assocs., archts.—consult. engrs., 1425 Walnut St., Phila., Zone 3, The Philadelphian Apartments, 2401 Pennsylvania Ave. $20,000,000.

▲ **Tex., Dallas**—HOSPITAL—Dallas East, Inc., c/o Walter B. Hallery, Jr., 10108 San Juan St., plans by George B. Dahl, 2101 N. St. Paul St., 266 bed hospital located east city, **$5,000,000.** CD 1/2/58.

▲ **Tex., San Antonio**—OFFICE—Southwestern Bell Telephone Co., 3333 Fannin St., Houston, plans by Page, Southerland & Page, 602 West Ave., Austin, Tex., 6-story Div. Office, off St. Marys and McCullough Ave., **$2,250,000.** CD 2/9.

▲ **Va., Arlington**—APARTMENTS—Harris & Sommers, 15 and Eades St., South Arlington, plans by Sheridan & Behm, 2030 16 St. North, two 10 story apartments and one 6 story apartment incl. 18th, 23rd, Eades and Fern Sts. South, **$11,000,000.** Horatio Allison, 24 S. Perry St., Rockville, Md., consult. engr.

▲ **Va., Norfolk**—APARTMENTS—Harvey L. Lindsay & Sons, 409 Yarmouth, 8 story apartments, Hampton Blvd.

▲ **Va., Norfolk**—SHOPPING CENTER—Tynes Whitehurst Co. Inc., Laskin Rd. and Hilltop, Virginia Beach, shopping center, Great Neck and Laskin Rds. **$3,000,000.**

INDUSTRIAL BUILDINGS

▲ **Ind., Fort Wayne**—TIRE-MAKING PLANT—B. F. Goodrich Co., 500 S. Main St., Akron, O., 850,000 sq. ft. tire-making plant, **$8,000,000-$10,000,000.**

▲ **Ky., Calvert City**—PLANT—Penn-Olin Chemical Co. (Olin Mathieson Chemical Co., 450 Park Ave., New York 22, N. Y., and Pennsalt Chemicals Co., Penn Center Plaza, Phila., Pa.), chlorate chemicals plant. **$6,500,000.**

▲ **Mich., Romulus**—PLANT—Kelsey-Hayes Co., 3600 Military Rd., Detroit, Zone 32, plant to manufacture wheels. **$4,000,000.**

▲ **Tex., Houston**—PLANT—Ethyl Corp., 3910 W. Alabama St., Vinyl Chloride Monomer Plant, **$6,000,000;** site area earthwork, **$70,000;** water sys., **$60,000;** pavement plant area and auto center, **$100,000;** storage, **$110,000,** Houston Ship Channel.

▲ **W. Va., Grant Town**—COAL CLEANING PLANT—Eastern Gas & Fuel Assocs., Koppers Bldg., Pittsburgh, Pa., 12,500 tons per day capacity coal cleaning plant, **$10,000,000-$12,000,000.** Constr. this fall.

▲ **Alta., Red Deer**—PULP AND PAPER MILL—Alberta Pulp Mills Ltd., Red Deer, pulp and paper mill, Rocky Mountain House, near here. **$50,000,000.** CD 4/6/49.

UNCLASSIFIED

▲ **Calif., San Francisco**—MUSEUM IMPRVS.—City and San Francisco Co., Dpt. P. Wks., City Hall, plans by Gardner A. Dailey, 442 Post St., reconstr. and expand wing at de Young Museum in Golden Gate Park. **$2,750,000.** CD 11/13/47.

▲ **Ga., Athens** — COLISEUM — University System of Georgia Building Auth., 244 Washington St. S. W., Atlanta, plans by Cooper, Barrett, Skinner, Woodbury & Cooper, Inc., 501 Henry Grady Bldg., Atlanta, agricultural-athletic coliseum at University of Georgia, incl. gym., livestock exhibition area, etc. **$3,000,000.** CD 2/14/52.

▲ **Hawaii, Honolulu**—PASSENGER—CARGO TERMINAL—State Bd. Harbor Comrs., 700 Fort St., Honolulu, passenger-cargo terminal, incl. 750 ft. Pier 8, 1,000 ft. exten. Pier 9. **$6,500,000.** Law & Wilson-Tudor Engineering Co., 441 N. King, consult. engrs.

Oregon — SUBSTATIONS — Bonneville Power Admin., Portland Headquarters, P.O. Box 3537, Portland,
Fern Ridge Substation, near Eugene, **$137,000** ($23,000 appropriated).
Gold Beach Substation addns., **$160,000,** ($25,000 appropriated).
Hampton Butte Substation, **$158,000** ($2,000 appropriated).
Hanna Substation addns., **$244,000,** ($61,000 appropriated).
Ione Substation, **$73,000,** ($20,000 appropriated).
structure replacements, access roads, etc., Redmont, Bandon J. D. Ross Substations, Portland area, **$1,284,000,** ($684,000 appropriated).
Wren Substation, near Albany, **$216,000,** ($54,000 appropriated).
transmission facilities, Portland area, **$160,000,** ($25,000 appropriated).
128 mi. transmission lines, Harney Electric Cooperative Service, near Burns, **$2,554,000,** ($1,129,000 appropriated).
storage facilities addns., Alvey Substation, near Eugene and Ross Substation, north of Portland, **$126,000,** (no appropriation).
supply service center, Ross Substation, **$1,753,000,** (no appropriation).
J. D. Ross Substation, **$358,000,** (no appropriation).

▲ **Pa., Phila.**—STADIUM—Dpt. Procurement, City Hall Annex, plans by Eshbach, Pullinger, Stevens & Bruder, 1519 Walnut St., stadium, Pennypack Park Area. **$10,000,000.** CD 11/24/44.

▲ **Vt., Lyndonville**—SKI RESORT—Ski Burke Mountain Inc., Burke Mountain, ski resort, incl. hotel dormitories, ski lift, trails, etc. Burke Mountain, **$2,500,000.** Constr. 1961.

▲† **Washington** — SUBSTATION and TRANSMISSION LINES—Bonneville Power Admin., Portland Headquarters, P.O. Box 3537, Portland, Ore., Midway substation, near East White Bluffs, **$566,000,** (no appropriation); 8 mi. transmission lines between Keoku and E. Wenatchee, Douglas Co., **$521,000,** (no appropriation); 78 mi. transmission lines Rocky Reach-Maple Valley No. 2 between Seattle and Columbia, **$7,388,000,** (no appropriation). CD 1/22/58.

(Proposal Advertisements see pp. 79 to 81)

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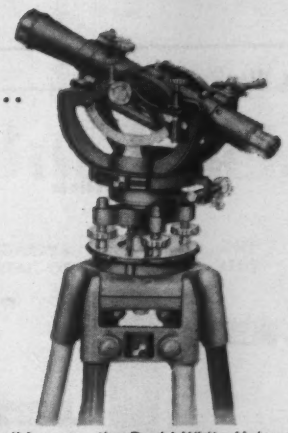

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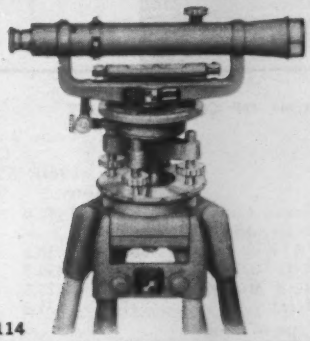

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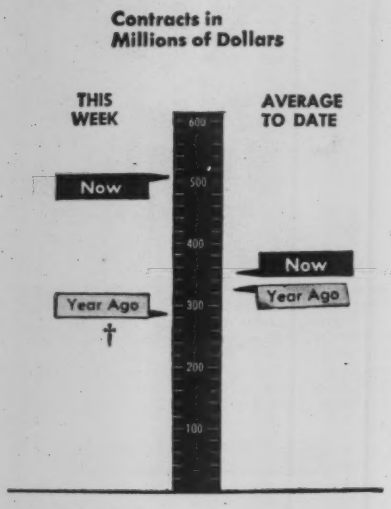
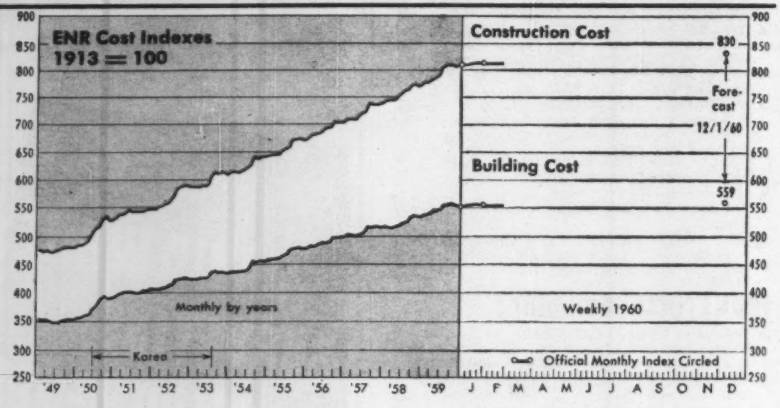
Construction Scoreboard

This Week...





ENR INDEXES (1913=100), 20-cities' average	Week of Feb. 25 1960	% Change from Jan. 28 1960	% Change from Feb. 26 1959
Construction Cost	812.72	−0.03	+4.01
Building Cost	555.22	−0.04	+2.76

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

	This Week	Cum. 9 wks* 1960	Chge '59-'60 %
	millions		
All Heavy Constr.	$505.6	$3,172.9	+ 7
By Ownership			
PRIVATE	266.2	1,716.2	+19
PUBLIC	239.4	1,456.7	− 5
State & Municipal	202.2	1,125.3	+ 4
Federal	37.2	331.4	−25
By Type of Work			
PUBLIC			
Waterworks	8.2	50.1	−35
Sewerage	11.2	97.3	− 1
Bridges*	67.9	169.3	+65
Highways	55.2	413.4	− 2
Earthworks, Dams & Waterways	7.9	109.9	+27
Buildings:			
Excl. Housing	47.3	302.5	−27
Housing	1.0	84.3	+ 5
Unclassified	40.6	231.0	− 7
PRIVATE			
Buildings:			
Mass Housing	81.4	766.5	+31
Commercial	14.1	294.9	−23
Industrial	60.0	467.4	+22
Unclassified	110.8	186.3	+119

*Includes private bridges
*Revised to include Alaska and Hawaii
†4 day week

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

Capital . . .

New Capital For Construction	Week of Feb. 25	Cum. 8 wks 1960	Chge '59-'60 %
	millions		
Corporate Securities	$ 5.5	$ 312.7	−39
State and Municipal:			
All Except Housing	102.2	1,114.8	+43
Housing	1.9	2.6	+100
Federal Loans	3.7	10.8	−28
Federal Aid	....	....	....
Total Nonfederal	$107.8	$1,435.5	+ 8
Federal Appropriations:			
Projects in U. S.	....	....	....
Outside U. S.	....	....	....
Total New Capital	$107.8	$1,435.5	+ 8

STATE AND MUNICIPAL BOND SALES

	1960 Feb. (millions)	1960 2-Mos. (millions)	Percent Change from 1959 Feb.	Percent Change from 1959 2-Mos.
All Construction	$368.4	$1,117.4	− 35.9	+ 3.4
Buildings	168.4	547.1	− 28.7	+45.6
Schools	132.0	356.0	+ 14.9	+49.5
Housing	2.0	2.6	.....	+97.8
Other buildings	34.4	188.6	− 71.7	+38.4
Heavy Construction	200.0	570.3	− 40.9	−19.1
Waterworks	32.3	53.1	− 45.6	−44.5
Sewerage	54.7	86.8	+112.6	+26.5
Bridges	1.1	4.7	− 44.2	+136.2
Highways	21.8	70.0	− 65.6	− 6.6
Earthwork, dams, waterways	3.2	124.0	− 75.7	−48.9
Electric and gas utilities	4.0	82.0	+ 15.0	+199.9
Airports	43.0	51.9	− 65.5	−58.4
Parking facilities	1.2	2.2	− 37.4	−63.6
Other unclassified	38.7	95.7	− 13.6	+53.3

CONSTRUCTION MACHINERY PRICE INDEXES

Manufacturers Prices, 1947–49 = 100—BLS	Jan. 1960	Percent Change from last Month	Percent Change from last Year
All Types	173.6	+0.4	+1.6
Cranes, Draglines, Shovels	171.2	+0.4	+1.7
Shovel, ¾ cu yd	173.9	0	+0.3
Shovel, 1–1½ cu yd	187.0	+1.5	+1.8
Shovel, 2–2½ cu yd	164.7	0	+3.7
Crane, truck mounted	168.2	+1.2	−0.4
Scrapers and Graders	165.8	0	+1.2
Scraper, 4 Wheel, 12–15 cu yd	156.8	0	0
Grader, heavy duty	172.6	0	+0.9
Tractors (non-farm; incl. industrial)	189.9	+0.6	+1.6
Wheel-type, off-highway (January 1955 = 100)	129.0	0	+0.6
Crawler type, 100–154 dhp	192.4	0	+0.6
Machinery, Tractor Mounted	169.0	0	+0.4
Dozer, hydraulic control	186.6	0	0
Loader, shovel type	162.5	0	+0.9
Specialized Machinery	156.2	0	+2.0
Ditcher	150.1	0	−4.2
Roller, tandem	220.2	0	+10.9
Roller, 3 wheels	174.9	0	+2.8
Portable Air Compressors	167.5	0	+5.0
Contractors Air Tools	181.6	0	0
Mixers, Pavers, Spreaders	158.2	+0.4	+2.7
Mixer, truck, 6 cu yd	159.6	0	+2.6
Mixer, paving, 34 cu ft	193.5	0	+2.3
Bituminous paver	163.2	0	0

A Big, Growing Market—But Tricky

Latin America continues to be a promising market for construction.

Volume of work under way and proposed for 1960 totals $19.3 billion, according to CONSTRUCCION, a McGraw-Hill International publication. The total consists of public and private projects of $1 million or more.

All proposals are either backed with a cash appropriation or are on engineers' and architects' drawing boards. In 1954, this total was $7.11 billion. Last year, it was $17.4 billion.

The six-year leap from slightly more than $7 billion to close to $20 billion to some extent reflects a general inflation in Latin America. Still, more of that jump represents increased physical volume of work under way and planned than inflation.

Continued growth in construction planning is a certainty. Population increases will bring a demand for more public works and a larger market for industrial goods, both capital and consumer.

The annual rate of population growth has jumped from 1.3% in 1930 to 2.5% last year. There are now more than 180 million people in Latin America. By 1975, population will be 275 million and the annual growth rate will be up to 2.7%.

New construction money will become available to Latin America. Both the International Development Association, a soft-currency lending arm of the World Bank, and the $1-billion Inter-American Development Bank are expected to start operations this year.

The increased flow of funds for development will add impetus to construction market growth. But it will hardly make the region the private preserve of U. S. contractors and engineers. Competition from European and Japanese concerns increases yearly. Even Spain, a country that has required outside help for its own development, is now entering the contest for Latin American business.

Only last week, Panama obtained from Spain the promise of all technical help that would be needed in order to develop electric power resources and port installations.

New funds may help to stabilize the erratic market that characterizes Latin American construction progress. One week jobs move, the next they are delayed or halted because funds have been spent. This stop and go quality of the Latin American market must always be reckoned with in considering market potential.

These nations plan to spend $19.3 billion for construction in '60.

Five countries claim more than $16 billion of the $19-billion total proposed and under way. The countries and their volume: Argentina, $7.48 billion; Brazil, $3.27 billion; Mexico, $2.38 billion; Venezuela, $1.57 billion; and Chile, $1.54 billion.

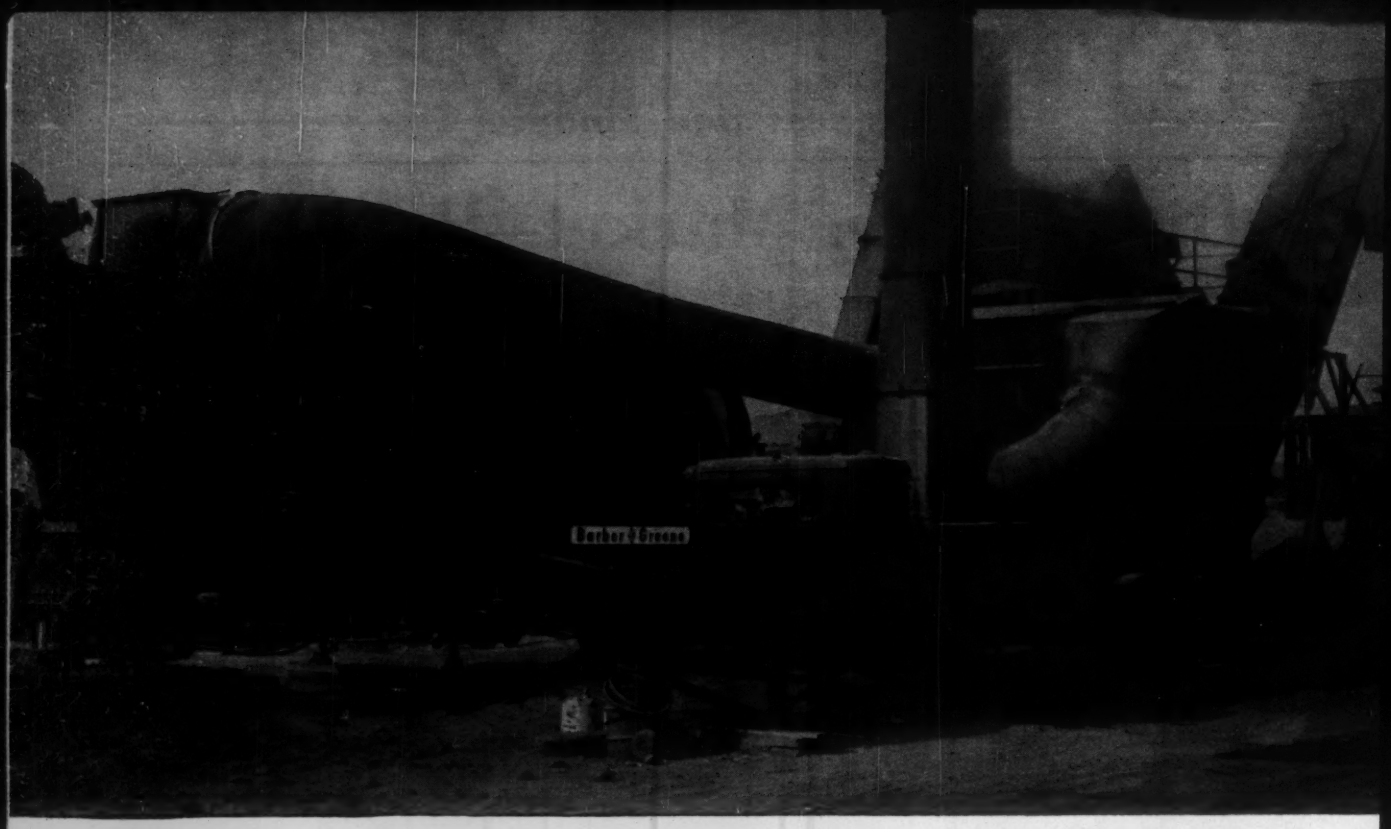
Power development claims the largest portion of Argentina's program—$2.38 billion. Next is industrial buildings with $1.29 billion.

Argentina offers an example of the erratic quality of the market. In the period 1954-58, investment in public and private construction amounted to nearly 11% of the Gross National Product. But last year, a sharp contraction of construction activity occurred. Work under government contract came to a standstill when the government could not pay contractors' bills. Private work was also squeezed by a tightening in funds available for mortgage financing. The result was a drastic reduction of 50% to 60% in construction activity.

To offset the rapid deterioration, the government jumped in with an emergency public housing program that is designed to provide shelter for some 10,000 families.

Now the 1959 squeeze appears to be easing. Reports out of Argentina indicate construction funds have again been built up and appropriations made to continue projects that were halted. In

(*Continued p. 76*)



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Lloyd Miller, partner in San Ore Const. Co., McPherson, Kansas, reports: "During the past 20 years, we have owned six Barber-Greene plants and eight Barber-Greene finishers.

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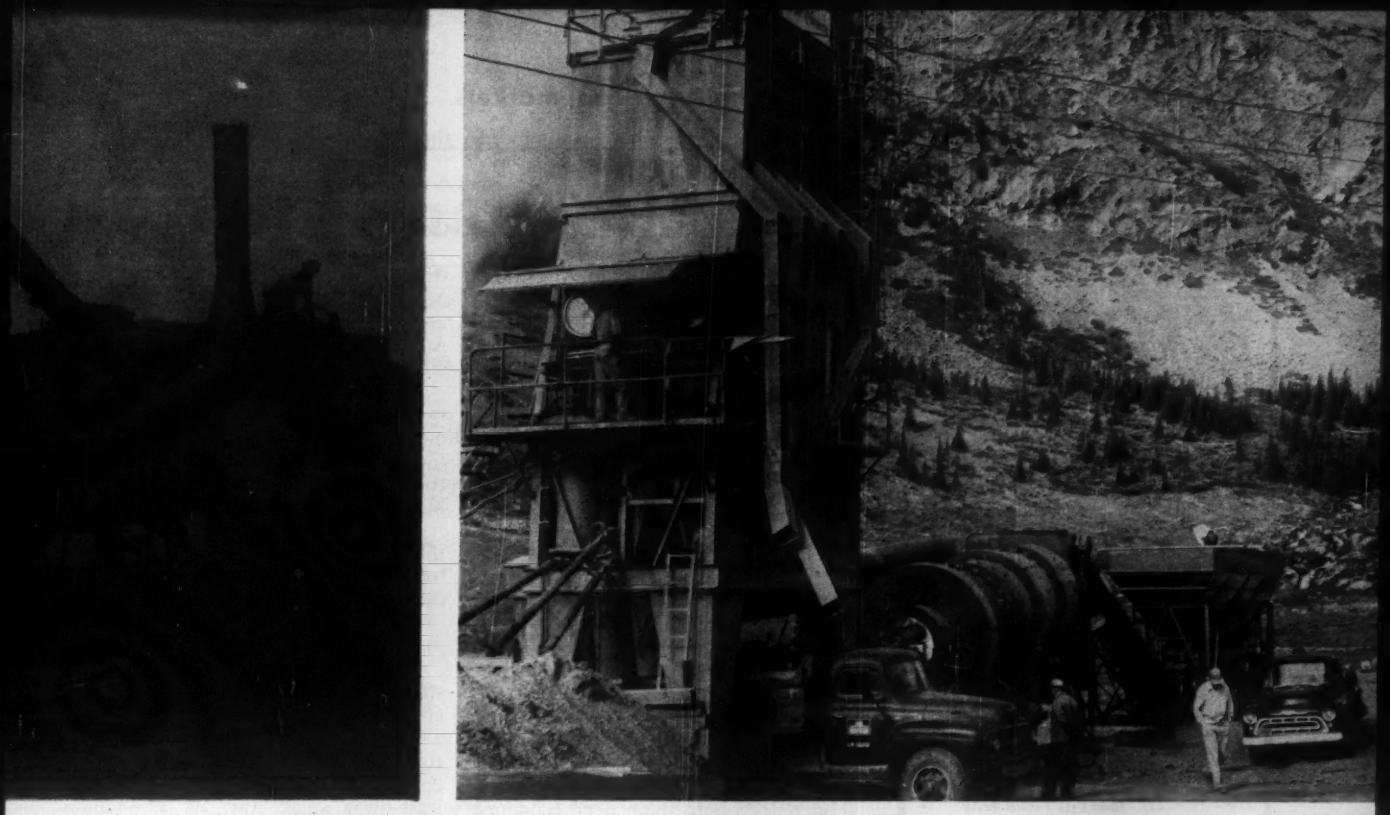
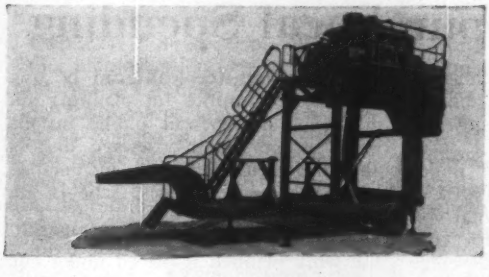
BATCHOMATIC BENEFITS—And with any BatchOmatic plant you get these new features and improvements; • push-button control from automatic to manual operation for quick mix changes; • most rugged and reliable automatic control system cuts maintenance in half; • exclusive Dyna Mix pugmill gives fastest mixing time; • fastest discharge; • up to 10% more tonnage with advanced cycling principle; • over 25% greater sand screening capacity; • plant completely pre-wired; • completely hydraulic operation; and • tower comes in complete self-contained sections.



Having previously owned four Barber-Greene asphalt plants in 16 years, San Ore Const. Co., in 1956, purchased their 848 Continuous and 896 BatchOmatic plants which are now nearing their 1,000,000th ton of mix.

OR BATCHOMATIC? PROFITS FROM BOTH



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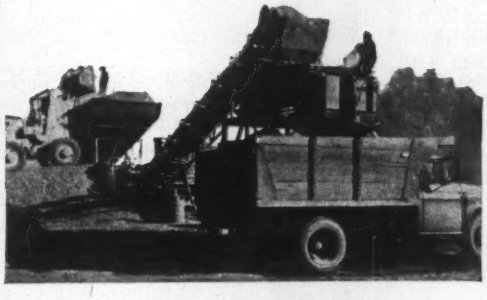

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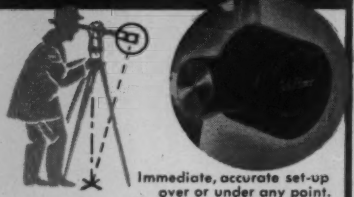

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. . . Latin American markets

addition, the government announced plans for an expanded public works program.

Last year U.S. and European companies committed themselves to more than $100 million worth of new industrial and chemical plants in Argentina. The largest part of that total was placed during the last four months of the year.

Venezuela, one of the big five in planning, has reduced its 1960 construction target. Its total of $1.57 billion in proposals and work under way is down from 1959's volume of $1.68 billion.

The outlook for this year is hazy. Further declines may be encountered.

Reasons given by the Chamber of the Construction Industry are:

- Lack of financing, due to general restrictions on bank credit, reduced foreign investment and some flight of capital from the country. The Central Bank is reportedly discriminating against construction in favor of industry and agriculture.
- Reduction in public works spending stemming from government budgetary difficulties.
- Cutback in private building activity. This reflects both the general economic recession and new proposed laws and regulations, including additional taxes on real estate, and rent control.
- Delay and withholding of payments for some public works built during the 1958 dictatorial regime.

The organization hopes that there may be some improvement in coming months as cash becomes available.

To free some funds for construction, the government promises to reduce drastically its top-heavy bureaucracy and thereby trim the administrative outlays.

Also in the offing is a $30-million home loan guarantee program to be backed by the Venezuelan Development Corp.

Brazil looks to a $3.27-billion construction program in 1960, including new starts and continuation of work under way. But as with most Latin American planning, actual cash expenditures will be far below that figure.

Housing and industrial building are two markets that generally show a bit more life than other types of construction. Credit shortages plague the country and the construction industry, holding back public works programs.

Feeling the pinch least, perhaps, is the Brasilia program. Despite sharp budget cuts in other fields, the government is making sure that construction of the country's new capital will not be seriously delayed.

Mexico's construction program is starting to show signs of an upswing after coming to a near-halt during the change of government in 1958. Continuation of the trend will put the country well on the road to starting, at least in a small way, its $2.4-billion 1960 construction program.

The nationalized oil industry will add its weight to the total this year with construction outlays of more than $100 million. It will be the biggest construction program so far by Pemex, the government's oil company.

Chile's 1960 program of planned works totals $1.54 billion, with power development claiming the largest amount—$459.1 million. Highways are next, with plans for $210.9 million.

Free Loans Spur Local Spending

A $30-million, interest-free lending program is generating $1.78 billion worth of local public works construction in the U.S.

The volume of construction under way and being planned involves 1,235 projects in 49 states. Of the total volume $902.3 million will go for construction of 700 water and sewerage projects.

The program, set up as part of the Housing Act of 1954, authorizes a revolving fund of $48 million for planning loans to communities. About $30 million has been appropriated and another $7 million is requested for the fiscal year 1961.

The Community Facilities Administration of the Housing and Home Finance Agency, administrator of the program, estimates that if the full $48 million becomes available, about $3 billion worth of construction would result.

The interest-free loans can be used by the communities for planning and design of all types of public installations: water systems, sewage disposal and treatment facilities, incinerators, hospitals, roads, bridges, schools and parks.

Loans become due and payable when the work planned is placed under construction. If a community constructs only a part of the project planned, it repays only a proportionate amount of the loan to the Community Facilities Administration.

To date, schools in planning under the program have an estimated construction cost of $234 million. Public buildings are next with an estimated cost of $209.5 million.

Highways and streets in planning have an estimated cost of $70 million; bridges, an estimated construction cost of $66 million.

Boycott Change Losing Ground

- Labor-backed measure may be stalled in House despite strong Administration support.
- Contractor arguments against change in labor law sway key Republican on House subcommittee.

The Administration this week threw its weight in Congress behind a labor-backed bill to ease Taft-Hartley restrictions on construction site picketing. But it appeared to be both too little and too late.

The final outcome is still uncertain, but the measure's prospects had already begun faltering on Monday when Under-Secretary of Labor James P. O'Connell appeared at the wind-up session of a House Labor Subcommittee.

He reiterated President Eisenhower's support, first given in 1954, for the proposal to lift the secondary boycott restrictions on building trades unions to allow them to picket a multi-employer project.

The proposed legislation does not call for a blanket boycott exemption. It would simply legalize strikes at construction sites where more than one employer is working and where a valid labor dispute exists over the wages, hours and working conditions of any of the workers at the site.

Present law is designed to shield neutral employers from the labor disputes of other employers.

Said Mr. O'Connell: "The realities of the relationships among such employers so engaged at a single construction site refute any valid claim that any of them are 'innocent third parties', so neutral to the dispute that they should be insulated from the effects [of lawful picketing]."

However, heavy resistance from more than a score of contractor associations and individual contractors appears, at this point, to have successfully stalled the bill in this session.

At least one Congressman who indicated previous support for the proposition—ranking committee Republican Carroll Kearns of Pennsylvania has changed his mind.

Mr. Kearns, on whom the AFL-CIO building trades unions had counted for support, stated late in the hearings that passage of the measure, H.R. 9070, "at this time . . . will accomplish nothing and will only add to the confusion."

Actually, no Taft-Hartley amendment ever got off to a more auspicious beginning. When the picketing proposal was dropped at the last moment from the Landrum-Griffin bill last session, both Senate and House leaders pledged to bring it up early this session. Between the AFL-CIO and the Administration, it was believed there was enough support for passage. But that belief rested on quick House action, which now seems unlikely.

The hearings opened with the testimony of Richard J. Gray, retiring president of the AFL-CIO Building Trades Department.

Mr. Gray said that a technicality in the law, as applied by the U. S. Supreme Court, deprives construction workers of a right, enjoyed by factory unions, to engage in peaceful picketing in a labor dispute at a common employment site. As a result, he claimed, nonunion men are forced against their will to work alongside nonunion workers, and unions are denied the right to protect their wages and working conditions.

Mr. Gray conceded that construction unions would use the right to strike, if granted, as an organizational device, but he minimized the possible effects of the proposal on picketing against use of nonunion goods.

Construction industry representatives challenged this point and all others advanced by Mr. Gray and other craft union officials.

The dispute centered on a Supreme Court decision in what is known as the Denver Building Trades case. This held that building trades picketing against a nonunion electrical contractor was illegal because it closed down the project and forced the general contractor to end his contract with the electrical firm.

Supporting this rule, Frank J. Rooney, Chairman of the Labor Committee of the Associated General Contractors, argued that present rules, despite the Denver case, permit limited craft picketing—providing the picketing is done at the time the employer involved in the dispute is on the site and engaged in normal business; that it is done reasonably close to the site; and that the picketing clearly names the employer involved. The hitch under the Denver case is that the picketing becomes illegal if even one of its many objects is to force someone to quit doing business with someone else.

To change the law, Mr. Rooney told the committee, "would cause labor unrest and actually encourage strikes and picketing in construction . . ." by permitting any local union to picket an entire construction site.

Throughout their testimony, the employers objected to the attempt to classify them as a single employer and came up with a variety of other complaints against the proposal:

- Said Mr. Rooney: ". . . It would give the CIO industrial unions a right to strike and refuse to perform services where any construction, alteration, painting or repair or other work was going on . . ."
- National Association of Home Builders' representative Rodney M. Lockewood said that lifting the secondary boycott ban would lead to open union war on handling new construction materials. He said attempts by contractors to use "revolutionary" new materials, under the proposed rule, would "license economic coercion on neutral employers and employees . . ."
- Paul J. Brienza, managing director of the Building Contractors Association of New Jersey, noted that some state laws require separate bids on work that would otherwise be subcontracted. Result, he said, is that union and nonunion contractors often turn up on the same project. A union attempt to organize the nonunion workers by picketing can shut down work on the entire project.
- Charles B. Mehin, representing the National Chamber of Commerce, accused the building trades unions of being "for the past three years . . . the greatest users of the secondary boycott." In 1958, he said, craft unions "were charged with more than 41% of the secondary boycotts."

(*Labor continued p. 78*)

Apprenticeship: None for Negroes?

The construction industry was charged last week with the "almost total exclusion" of Negroes from apprenticeship programs.

Less than one percent of construction apprentices are Negroes, says the National Association for the Advancement of Colored People in a report called, "The Negro Wage Earner and Apprenticeship Training Programs."

NAACP calls this a waste of the nation's manpower resources and claims it has come about in direct violation of the Federal Constitution, at least 16 state statutes and the President's Executive Orders barring racial discrimination on all federal contracts.

Although the association singled out the electrical workers, plumbers, carpenters, iron workers, operating engineers, laborers, sheet metal workers, and bricklayers for particular criticism, it lays responsibility for racial discrimination squarely at the feet of management. It is there, NAACP says, that "the ultimate authority to hire" resides—a fact brought home to the construction industry in the Mountain-Pacific case.

NAACP condemns the disparity that exists between the declared policy of the AFL-CIO and the realities of discrimination that exist in the North as well as the South. And it accuses state and municipal anti-discrimination commissions and various federal agencies of failure to invoke the powers at their command to eliminate racial discrimination in apprentice training.

It calls for a vast overhaul of present apprenticeship programs and procedures, and urges the withdrawal of public monies at every level from discriminatory apprenticeship programs.

The report was submitted to Vice President Nixon, who heads the President's Committee on Government Contracts. The committee has been accused of giving more lip service than action to the present ban against racial discrimination on federal construction projects (ENR Feb. 25, p. 116). Taking a dim view of the chances Negroes have of becoming skilled craftsmen, NAACP says it would take 138 years, or until 2094, for them to secure equal participation in skilled training and employment, under present conditions.

The report, which is not limited to the construction trades, traces the development of discrimination and white supremacy in the skilled trades from the days of slavery. It explores the economic and social evils involved, analyzes the racial distribution of male workers by trades, and concludes that Negroes are under-represented in most occupations, including 10 construction trades.

Negroes who do get hired are paid less than white workers, are apt to get the dirtiest and meanest of jobs and are the first to be placed in the ranks of the unemployed, it contends.

It finds the same kind of exclusion in apprenticeship, which is the principal gateway to the skilled trades.

Using the last census figures, NAACP found that only 90 of the 11,010 plumbing apprentices were Negro. For carpenters, the figure was 60 out of 9,930; for electricians, 90 out of 9,360.

"Outside of the New York local of the International Brotherhood of Electrical Workers," it says, "Negroes still . . . do not get in as electrical apprentices; hence they cannot later qualify for membership. Open access to plumbing and pipe fitting apprentices is not, at best, a common experience for Negro youth. Apprenticeship positions open to Negroes in the woodworking trade do not appear to be large enough even to offset attrition occurring among Negro carpenters. Similarly, Negro youth are not apprenticed, or are apprenticed in negligible numbers, by the Sheet Metal Workers; the Ornamental and Structural Iron Workers; the Glass Workers; the Tile Setters; the Machinists; and Bricklayers; indeed the latter seems to be inordinately proud of segregated locals."

NAACP asserts that craft unions, aided by "cronyism" and industrial nepotism, have used various tricks and devices to exclude Negroes. Among them, it says, are segregated locals with limited and inconsequential jurisdiction, biased procedures in hiring hall referrals, imposition of high initiation fees and dues, suspension of Negroes for minor infractions of union rules, unreasonably restrictive ratios of apprentices to journeymen and domination of joint apprenticeship committees.

The association, convinced that the quality and quantity of apprentices, Negro or Caucasian, must be tremendously improved to meet the nation's future manpower needs, has recommended a broad expansion of apprenticeship programs. This should be coupled, it said, with better public relations to sell the apprenticeship system, better vocational guidance, elimination of discrimination, management exercise of its responsibility, and enforcement of present laws.

Among NAACP's specific recommendations are these:

- Scholarship programs to subsidize apprentices in an effort to attract more capable youngsters into sometimes long and poorly paid training programs.
- Reduction, where possible, of the length of apprenticeship.
- Review of existing ratios of apprentices to journeymen and a reduction of the ratios where possible.
- Use of objective criteria for selection of apprentices. Notice of all acceptances and rejections in writing, with an explanation of the applicant's failure to meet established criteria.

. . . Discrimination Probe Promised

Richard Gray last week promised an investigation of discrimination practices in construction trade unions.

The retiring president of the AFL-CIO Building and Construction Trades Department said the building trades unions "fully support the nondiscrimination clause contained in the AFL-CIO constitution. Respectfully request that the government committee on discriminatory practices on federal projects notify this office of any complaints of racial discrimination on construction jobs or in apprenticeship projects."

"I can assure you," he added, "that this office will investigate each and every such complaint and will do everything within our power to immediately correct any incidents of discrimination in employment or in apprenticeship."

Mr. Gray's remarks on discrimination were made to Vice President Richard Nixon and Labor Secretary James Mitchell in a telegram commenting on a charge of discrimination in training programs by the National Association for the Advancement of Colored People (see story above). At the same time, the department's Executive Council discussed job disputes and jurisdictional troubles its members are having with industrial unions and came to these conclusions:

- "That whatever machinery is ultimately established must deal with disputes—and disputes only—and cannot be vested with authority to pass upon basic jurisdiction of trade unions."
- "That this department and its affiliates are not opposed to the use of arbitration . . . provided there are sufficient and effective safeguards to protect the interest of the organizations affiliated with this department."

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: March 17, 1960

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time, on the 17th day of March 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON District Engineer, 353 Broadway, Albany 1, New York						
Albany & Schenectady	FITS 60-3	City of Schenectady: Crosstown Connection, FAC 58-26P; Interstate Rte. Conn. 550, Schenectady Crosstown to Thruway, FISH 58-20; NYS Thruway-mohawk Sec. (Interchange 25 Connection) ST 58-2. Proj. U-323(20); I-890-5(15)	2.22 (1.44 Acc.)	Traffic Signs	$2,200 Plans $5	$40,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida (Rte. 8)	FARC 60-21	Utica-Poland, Pt. 2B, S.H. 5691A Utica-Poland, Pt. 3, S.H. 5597 Proj. S-482(1)	4.13	Asph. Conc. Ty. 1A=4.13 Mi. Widen Reinf. Conc. Slab Br. Span 20'	$35,000 Plans $5	591,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	FAC 60-7 FASH 60-2	Rochester City: Innerloop (Front St. to North St.); Rochester Outerloop, (Winton Rd. South-Highland Ave.) Proj. U-1089(13); U-1093(7)	2.74 (2.30 Acc.)	Asph. Conc.=0.79 Mi., Misc. Work=0.10 Mi.; Demol. & Grad.=1.85 Mi., 4 Hwy. Gr. Sep. & 1 Br. Comp. I-Beams, 7 Spans 371.0'; 1 Span 76.5', 1 Span 86.4'; 1 Span 72.1', 2 Spans 136.0'	$225,000 Plans $10	4,132,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie (Rt. 5)	FARC 60-19	Williamsville Village, S.H. 5061 Main Street, Pt. 2, S.H. 87 Proj. F-933(6)	1.23	Asph. Conc.=1.18 Mi. Misc Work=0.05 Mi.	$35,000 Plans $5	629,000
DISTRICT No. 6. JAMES H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany (Rte. 19, 408)	FARC 60-18	Friendship-Belmont, S.H. 5341 Belvidere-Transit Bridge-Angelica, S.H. 1260 Proj. F-FG-332(8)	4.63	Asph. Conc.=4.63 Mi. Br. 1 Twin Box Reinf. Conc; 12'x6.2' Br. Over Erie RR & Creek Comp. I-Beam 4 Spans 280.8'	$80,000 Plans $5	1,442,000
DISTRICT No. 7, ROBERT W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Int. Rt. 87)	FITS 60-2	Int. Rte. 502, Sec. 7B-1 (Salmon River to Rugar St.) FISH 59-2; Sec. 7B-2, (Rugar St. to Cumberland Head Rd.), FISH 58-23, FIC 58-1; Plattsburgh-Keeseville, Pt. 1, S.H. 56 Proj. I-87-1(17)	4.91 (1.89 Acc.)	Traffic Signs	$1,200 Plans $5	21,000
DISTRICT No. 8, KURT G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Dutchess (Rt. 199, 82)	FARC 60-20	Amenia-Pine Plains, Pt. 2, S.H. 5628 Lafayette-Pine Plains-Winchell, Pt. 1, S.H. 1313 Proj. F-594(4), F-468(12)	1.08	Asphalt Concrete	$12,000 Plans $5	219,000
Dutchess (Rt. 44)	R.C. 60-24	Washington Hollow-Millbrook S.H. 609 Millbrook Village, S.H. 1114	1.58	Asphalt Concrete	$10,000 Plans $5	186,000
Rockland & Westchester	T.C. 60-1	Broadway-Hastings-Dobbs Ferry-Mt. Pleasant-Tarrytown-N. Tarrytown, S.H. 9206; White Plains-Eastview Rd., S.H. 5571; Spring Valley-Knapps Corners, S.H. 689; Knapps Corners-Nyack, S.H. 5178	—	Traffic Signals	$2,500 Plans $5	45,000
DISTRICT No. 9, JOSEPH C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Delaware (Rte. 206)	FARC 60-23	Walton-Downsville, Pt. 1, S.H. 8515 Walton-Downsville, Pt. 2, S.H. 48-18 Proj. S-44(6)	6.68	Asphalt Concrete	$44,000 Plans $5	804,000
Delaware	BWS 60-1	New York City: Board of Water Supply, Road No. 1 (Cannonsville Reservoir) (Stilesville Bridge)	0.16	Prestress. Conc. Beam Br. 6 Spans, 470.1 Ft.=0.09 Mi. Misc. Work=0.07 Mi.	$24,000 Plans $5	436,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx & New York	FICBE 60-2	Interstate Rte. Conn. 511 (Cont. 1A); Cross Bronx Expressway (Alexander Hamilton Br. Substructure) Proj. I-95-1(38)	0.31	Bridge Substructure=0.29 Mi. Misc. Work=0.02 Mi.	$180,000 Plans $5	3,340,000
Kings (Int. Rt. 278)	FIGE 60-2	Int. Rte. Conn. 512 Gowanus Expressway (20th to 36th Streets) Proj. I-278-1(47)	0.82 (0.82 Acc.)	Reinf. Conc. Slab Roadway (on Viaduct)=0.80 Mi., Misc. Work=0.02 Mi., Sheet Asph. Pavt. (Streets)=0.82 Mi., Alter & Strengthen Elevated Steel Struct. 80 Spans, 4,216'	$700,000 Plans $5	12,347,000
Nassau	FANE 60-1	Nassau Expressway (Cont. 1) Bayview Ave. to Broadway Proj. U-1098(5)	0.45	Demol. of Buildings	$1,000 Plans $5	18,000
Nassau	FAHHE 60-2	Horace Harding Expressway Ext. New York City-Nassau Co. Line to Guinea Woods Road Proj. U-862(26)	—	Roadside Development Access Ramps Delineators & Misc. Work	$15,000 Plans $5	262,000
Nassau & Suffolk	FALIE 60-1	Long Island Expressway (Nassau-Suffolk Co. Line to Pinelawn Rd. Proj. U-862(25)	2.63 (4.61 Acc.)	9" Cem. Conc. 2 @ 36=2.36 Mi., Misc. Work=0.27 Mi. Acc. 2.45 Mi. Conc.; 2.16 Mi. Asph Conc.; 4 Hwy. Gr. Seps. Comp. St. Em.; 4 Sps. 152.0'; 4 Sps. 236.3'; 4 Sps. 266.2'; 4 Sps. 258.0'	$240,000 Plans $5	4,110,000
Nassau & Suffolk	NSP 60-1 WSP 60-1	Northern State Parkway (N.Y. City Line-Sunken Meadow Spur); Wantagh State Parkway (Northern St. Parkway-Southern St. Parkway)	29.69	Fencing at Various Locations	$15,000 Plans $5	274,000
Suffolk (Rte. 27)	FARC 60-26	Sunrise Highway Extension S.H. No. FASH 58-5; FASH 58-6 Proj. U-947(20); F-947(20)	6.80	Roadside Development	$12,000 Plans $5	209,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: March 24, 1960

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 24th day of March 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rtes. 32 & 144)	R.C. 60-33	Albany-Bethlehem, S.H. 5499 and So. Pearl St. extension (City of Albany)	0.02	Clean. & Paint. Truss Bridge No. 1	$175 Plans $5	$3,200
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Niagara (Int. Trg. Rte. 190)	FINIE 60-1	Interstate Route 506, Niagara Expressway, Cont. 1 (Packard Road to Isherwood Dr.) Proj. I-190-1(27)	2.08	Grad. Drain. & Misc. Work	$31,000 Plans $5	563,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland (Rte. 303)	FARC 60-11	New Jersey State Line–Congers, Pt. 1, S.H. 1898	1.19	9" Cem. Conc. Pavt. 2 @ 24' Wide = 1.14 Mi.	$70,000	1,288,000
		New Jersey State Line–Congers, Pt. 2, S.H. 8448 Project U-528(8)	(0.37 Acc.)	Misc. Work = 0.05 Mi.; (Access = 0.22 Mi. Asph. Conc. Pavt. and 0.15 Mi. Cem. Conc. Pavt.)	Plans $5	
Westchester	TSP 60-1	Taconic State Parkway: Kitchawan Road Interchange, Northeast Ramp	0.39	8" Cem. Conc. Pavt. = 0.33 Mi. Misc. Work = 0.06 Mi.	$10,000 Plans $5	171,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 17C)	FARC 60-17	Lestershire, S.H. 125; Hooper-Johnson City, S.H. 5699 Proj. U-401(9), U-1143(2)	1.94 (1.96 Acc.)	Asph. Conc. Pavt. = 2.33 Mi. Grad. & Drain. = 1.57 Mi.	$160,000 Plans $5	2,958,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

SUPT. OF PUBLIC WORKS

Bids: March 23, 1960

Transmission Mains

NOTICE TO BIDDERS
FAIRFAX COUNTY WATER AUTHORITY
ANNANDALE, VIRGINIA
PROJECT 14

APPROXIMATELY 26.5 MILES OF 12" to 30" CAST IRON, STEEL OR PRESTRESSED CONCRETE PRESSURE PIPE WATER MAINS

Sealed proposals will be received by the Fairfax County Water Authority at the office of the Authority, 7310 Maple street, Annandale, Virginia, or by mail addressed to the Authority, P. O. Box 91, Annandale, Virginia, until 2:00 P. M., EASTERN STANDARD TIME, MARCH 23, 1960, at which time they will be read aloud, and contracts awarded as soon thereafter as practicable for the construction of water transmission mains at various locations in Fairfax County, Virginia.

The work comprises the furnishing of all materials and construction of the water mains and appurtenant work and is divided into four divisions, as follows:

Division A—Chain Bridge Road Water Main, comprising approximately 15,920 feet of 30" steel or concrete pipe water main.

Division B—Dunn Loring Road Water Main, comprising approximately 40,000 feet of 24" cast iron, steel or concrete pipe water main or 30" steel or concrete pipe water main.

Division C—Arlington Boulevard—Waples Mill Road Water Main, comprising approximately 1330 feet of 12" cast iron pipe water main and 34,800 feet of 18", 20" or 24" cast iron, steel or concrete pipe water main.

Division D—Floris Road Water Main, comprising approximately 23,650 feet of 14" or 16" cast iron pipe water main or 18" cast iron, steel or concrete pipe water main; 19,000 feet of 14" or 16" cast iron pipe water main and 4,650 feet of 12" cast iron pipe water main.

Bidders may submit proposals on any complete Division or any combination of complete Divisions. Bidders are required to submit proposals on all alternate sizes and all alternate materials.

The Instruction to Bidders, Proposal, Agreement, form of Bid Bond, Performance Bond, Plans and Specifications for the work may be examined at the office of the Fairfax County Water Authority, 7310 Maple Street, Annandale, Virginia, and at the office of Greeley and Hansen, Engineers, 14 East Jackson Boulevard, Chicago 4, Illinois. Copies of the Plans and Contract Documents may be obtained upon the deposit of $50.00 for each set, to be refunded upon return of such set in good condition within 10 days after the opening of bids.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the Fairfax County Water Authority, in the amount of $30,000.00 for *each* Division for which a proposal is submitted, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia, as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The Fairfax County Water Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interests of the Authority after all bids have been examined and canvassed.

FAIRFAX COUNTY WATER AUTHORITY

By: James J. Corbalis, Jr.
Engineer-Director

February 24, 1960

Bids: March 22, 1960

Port Authority Bus Terminal Alterations to Room 2226, Suburban Concourse

THE PORT OF NEW YORK AUTHORITY
CONTRACT BT-120.022

Sealed proposals for performing alterations in Room 2226 on the suburban concourse of the Port Authority Bus Terminal at 40th Street and Eighth Avenue will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, March 22,1960, at which time said proposals will be opened and read in Room 1108.

Contract Documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, March 3, 1960

District of Columbia—Building Construction—Dept. of Buildings & Grounds, February 18, 1960. CONSTRUCTION OF TYPE "X" LIVING FACILITIES AT THE YOUTH CORRECTIONAL CENTER, NEAR LORTON, VIRGINIA. (INVITATION NO. C-60127-B). Bid forms, plans and specifications are now available from Supervisor, Bid and Contract Division, Procurement Office, D. C., Rm. 404, 499 Pennsylvania Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, March 17, 1960, in Room 424, 499 Penn. Ave., N.W.

Read the Official Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

Bids: March 22, 1960

Penderwood Standpipe 1.0 or 2.0 M.G. Capacity

NOTICE TO BIDDERS
FAIRFAX COUNTY WATER AUTHORITY
ANNANDALE, VIRGINIA
PROJECT 16

Sealed proposals will be received by the Fairfax County Water Authority at the office of the Authority, 7310 Maple Street, Annandale, Virginia, or by mail addressed to the Authority, P. O. Box 91, Annandale, Virginia, until 3:00 P. M., EASTERN STANDARD TIME, MARCH 22, 1960, at which time they will be read aloud, and contracts awarded as soon thereafter as practicable for the construction of either a 1.0 MG or 2.0 MG steel standpipe and pipe connections to be located at Penderwood, Fairfax County, Virginia.

The work comprises the furnishing of all materials and the construction of a covered steel water storage tank at ground level, complete with 16" cast iron pipe connection, altitude valve vault, valves, fittings, fence and appurtenances.

The Instructions to Bidders, Proposal, Agreement, form of Bid Bond, Performance Bond, Plans and Specifications for the work may be examined at the office of the Fairfax County Water Authority, 7310 Maple Street, Annandale, Virginia, and at the office of Greeley and Hansen, Engineers, 14 East Jackson Boulevard, Chicago 4, Illinois. Copies of the Plans and Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after the opening of bids.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the Fairfax County Water Authority, in the amount of not less than five per cent of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia, as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The Fairfax County Water Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interests of the Authority after all bids have been examined and canvassed.

FAIRFAX COUNTY WATER AUTHORITY
By: James J. Corbalis, Jr.
Engineer-Director

February 24, 1960

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS

of

Engineering News-Record

for Opportunities to bid.

They might not see your announcements if printed elsewhere

You undoubtedly want their bids on your contracts.

Make sure of them on your next contract.

The cost is only $2.40 a line per issue.

OFFICIAL PROPOSALS

Bids: March 29, 1960

Port Newark Buildings 195 and 196

THE PORT OF NEW YORK AUTHORITY
CONTRACT PN-540.004

Sealed proposals for the construction of cargo distribution buildings 195 and 196 at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, March 29, 1960, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, March 3, 1960

Bids: April 24, 1960

Construction of Port of Um Qasr near Basrah

REPUBLIC OF IRAQ
IRAQI PORTS ADMINISTRATION

The closing date for tenders for the above project has been extended to 24th April, 1960.

Director General,
Iraqi Ports Administration,
Basrah.

Bids: March 22, 1960

Elevated Tank and Connections

NOTICE TO BIDDERS
FAIRFAX COUNTY WATER AUTHORITY
ANNANDALE, VIRGINIA
PROJECT 8

Sealed proposals will be received by the Fairfax County Water Authority at the office of the Authority, 7310 Maple Street, Annandale, Virginia, or by mail addressed to the Authority, P. O. Box 91, Annandale, Virginia, until 3:00 P. M., Eastern Standard Time, March 22, 1960, at which time they will be read aloud, and contracts awarded as soon thereafter as practicable for the construction of an elevated storage tank and connections on and adjacent to the Fairfax County Hospital grounds in the vicinity of Annandale, Fairfax County, Virginia.

The work comprises two Divisions, as follows:

Division A—The construction of approximately 1,400 linear feet of 16-inch cast iron pipe water main and appurtenances. The pipe will be furnished by the Authority.

Division B—The construction of a 1 million gallon elevated storage tank, complete with 12-inch cast iron pipe connections, valve vault, fence and all appurtenances.

The Instructions to Bidders, Proposal, Agreement, form of Bid Bond, Performance Bond, Plans and Specifications for the work may be examined at the office of the Fairfax County Water Authority, 7310 Maple Street, Annandale, Virginia, and at the office of Greeley and Hansen, Engineers, 14 East Jackson Boulevard, Chicago 4, Illinois. Copies of the Plans and Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after the opening of bids.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the Fairfax County Water Authority, in the amount of not less than five per cent of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia, as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The Fairfax County Water Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interests of the Authority after all bids have been examined and canvassed.

FAIRFAX COUNTY WATER AUTHORITY
By: James J. Corbalis, Jr.
Engineer-Director

February 24, 1960

Bids: March 24, 1960

Sewage Treatment Plant and Sanitary Sewers

NOTICE TO CONTRACTORS
VILLAGE OF UNION SPRINGS,
CAYUGA COUNTY, NEW YORK

Sealed proposals for furnishing all labor, equipment and material for the construction and installation of a Sewage Treatment Plant and Sanitary Sewers and appurtenances for the Village of Union Springs, New York, will be received by the Village Board of Trustees at the Village Hall, Union Springs, New York until 2:00 P.M. Eastern Standard Time on Wednesday, March 24, 1960, at which time they will be publicly opened and read aloud.

The work is divided into the following contracts:

1. Sewage Treatment Plant and Effluent Line.
2. Sanitary Sewers.

These contracts may be awarded separately or together as the Village Board may deem to be in the best interests of the Village.

The Contract Documents including the Information for Bidders, Form of Bid, Plans and Specifications, etc., may be examined at the office of the Village Clerk, Union Springs, New York, and copies thereof may be obtained from William T. Field, Consulting Engineer, Watertown, New York, upon a deposit of Twenty-Five ($25.00) Dollars for each set, which sum will be returned to all bidders upon their return in good condition within thirty (30) days after the opening of the bids.

The Village Board reserves the right to waive any informalities in or to reject any or all bids or to accept any bids that it deems to be in the best interest of the village.

Each bidder must deposit with each bid security in an amount of not less than five (5%) per centum of the bid the form and subject to the conditions provided for in the Information for Bidders.

VILLAGE OF UNION SPRINGS, N. Y.
Earl E. Fox, Mayor

Dated: February 23, 1960

WILLIAM T. FIELD
Consulting Engineer
Watertown, N. Y.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

MARCH 17TH ISSUE CLOSES MARCH 7TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division or ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Sales Engineer: To represent expanding prestressed concrete plant in Southeastern Wisconsin area. Structural design background in building field considered helpful. Send complete resume and salary requirements to P-3492, Engineering News-Record.

Assistant to Sanitary Engineer graduate Civil or Sanitary: Military obligation fulfilled, some experience in sewerage desirable: Salary: $5500-$5800: Location: Northeast Lake County, Ohio: Submit Resume. P-3619, Engineering News-Record.

Have opening for recent Civil Engineer Graduate with military obligations completed who desires to learn the construction business. Ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial building and heavy construction, and willing to move. Must be single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Martin K. Eby Construction Company, Inc. P. O. Box 1679, Wichita, Kansas.

Superintendent Wanted. Must have knowledge and experience in operation of pulverizing equipment. Four year job Arizona. In first letter state experience, qualifications, expected earnings and references. P-3785, Engineering News-Record.

Wanted: Deputy Director for Department of Public Improvement, Division of Waters and Sewers. Must have training and experience in the field of Sanitary Engineering and experience in Municipal Administration, and must be thoroughly familiar with engineering problems in the field of public works improvement. Apply Savannah Civil Service System, 8 East Bay Street, Savannah, Georgia.

City Engineer For Oberlin, Ohio. Graduate civil engineer with minimum two years experience in survey, drafting and general engineering wanted. Salary open. Send resume with application to Mr. Richard J. Dunn, City Manager, City Hall, Oberlin, Ohio.

Structural Designers—Consulting Engineering firm expanding operations in New England. Excellent opportunity for qualified experienced highway bridge designers. Salary open, give full particulars to P-3686, Engineering News-Record.

Construction Superintendent, Engineering Background essential, estimating experience helpful. General Contracting organization operating in Middle Atlantic States and dealing primarily in public buildings. Complete resume requested covering education, experience, salary requirements and when available. P-3731, Engineering News-Record.

Civil Engineer, Asst. to City Engineer, Public Works, Permanent position, Vac. Sick Leave, $6032. to $7020. Apply Personnel Division, City Hall, Woonsocket, Rhode Island, for details.

Soils and Foundation Engineer—Graduate Engineer experienced in boring supervision, compaction control, laboratory testing and foundation analysis. Advanced degree in Soil Mechanics desirable but not essential. Reply immediately to: Joseph S. Ward, Inc., 91 Roseland Ave., Caldwell, N. J., tel: CApital 6-9191.

• POSITIONS VACANT

Shaft Sinking Foreman—with experience in concrete lining and grouting. Take charge sinking two (2) shafts. Location—Far East. Status—Single. Contract—One (1) year. Salary—Open. Must be available June 1st. P-3832, Engineering News-Record.

Structural Engineer. Head Structural Section. Moderate Size Engineering Office Must be Registered, Ethically Motivated View Toward Associate Capacity. Powers & Associates, Municipal Airport, Iowa City, Iowa.

Opening for Engineering graduate to act as Project Manager, Field Supervisor, Estimator and Man Friday for growing construction company, New York area and East. Write P. O. Box 387, Scarsdale, N. Y.

Sanitary Engineer—Challenging position with top notch national organization. Duties include: writing for publications, public speaking, spot inspections of construction projects, attendance at national conventions, and providing technical help for other engineers in our organization. Age 30-40, M.S. degree helpful, salary open, mid-west location. Excellent opportunity for the right man. P-3807, Engineering News-Record.

B.C.E., M.S.C.E.,—35, 3 years consulting, 3 years hydraulic laboratory, hydrology, irrigation dams, model studies. Multi-lingual: German, French, Russian. Teaching or Consulting. P-3797, Engineering News-Record.

Diamond Drilling Foreman—must have had responsible charge of large drilling project, preferably with foreign experience. Location —Far East. Status—Single. Contract—One (1) year. Salary—Open. Must be available June 1st. P-3841, Engineering News-Record.

Estimator with road excavator and sewer experience. Able to supervise jobs. Age 30 to 50 yrs., Rochester, N. Y. area. P-3809, Engineering News-Record.

Wanted—Assistant Borough Engineer $6,000 to $7,000. College degree in engineering. Two or more years experience in municipal engineering or planning preferred. Complete job description available on request. Apply: W. H. Stead, Borough Engineer, 100 South Second Street, Chambersburg, Penna.

• SELLING OPPORTUNITY AVAILABLE

Manufacturer's Representatives — Leading Steel Manufacturer, Southern New Jersey, is seeking qualified representatives to handle sales of Structural Steel, Steel Joist, Roof Deck and Steel Buildings in Philadelphia, North Jersey, New York and New England Areas. Write for appointment giving full details in first letter. RW-3798, Engineering News-Record.

Wanted in Philadelphia, Pa. and Washington, D. C. Manufacturer's Representative on a profit sharing basis. One who now has a following among Builders, Contractors and Architects, to sell and promote a complete and well known line of waterproofings and preservative materials. Reply to Weatherguard Products Corp., 2341 Chatterton Avenue, Bronx 62, New York.

• EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 49 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

• POSITIONS WANTED

Construction Executive, age 36. Prefer equipment maintenance division of heavy construction firm. Experienced in labor relations, cost control, purchasing of machinery and parts inventory, rail and truck transportation, repair shop management and prevention maintenance on all types of construction equipment. PW-3692, Engineering News-Record.

Architect, American, in Europe, licensed N. Y., N. J. 25 years experience, six years in Europe as Chief Architect, seeks new position. A. Hofmann, 5 Vieux College, Geneva, Switz.

Superintendent-Estimator-Engineer, CE P.E. L.S. (N. J.) experienced public works, utilities, bridges, paving, desires position general contractor or municipality, N. J. PW-3734, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Project Manager. B.S.C.E., 16 yrs. exp., hvy. Const., Hwys., flood control, earthwork, bldgs., Govt. contracts, field & office. E. Eiswirth, P. O. Box 48 Clayton 5, Mo.

Construction Manager, graduate civil engineer, age 53, qualified for supervision all phases of heavy and industrial construction, last three years Federal projects of million dollar class, location preference southeast, available 60 days resume on request. PW-3745, Engineering News-Record.

(Continued on opposite page)

"Put Yourself in the Other Fellow's Place"

TO EMPLOYERS

TO EMPLOYEES

Letters written offering Employment or applying for same are written with the hope of satisfying a current need. An answer, regardless of whether it is favorable or not, is usually expected.

MR. EMPLOYER, won't you remove the mystery about the status of an employee's application by acknowledging all applicants and not just the promising candidates.

MR. EMPLOYEE you, too, can help by acknowledging applications and job offers. This would encourage more companies to answer position wanted ads in this section.

We make this suggestion in a spirit of helpful cooperation between employers and employees.

This section will be the more useful to all as a result of this consideration.

Classified Advertising Division

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330 West 42nd St., New York 36, N. Y.

HEATING and VENTILATING ENGINEER

Mechanical Engineer with several years experience in consulting engineering or architectural office, working with heating or air-conditioning design. Position open in product design and development section of manufacturer of air distribution systems for multi-story buildings. Work consists of creative design and experimental models, field engineering trips and some sales contact during introductory period. Liberal salary and fringe benefits with stable national firm. Please forward resume of experience, education and salary requirements.

Harry C. Bott, Personnel Department
GRANITE CITY STEEL COMPANY
Granite City, Illinois

CONSTRUCTION MANAGER

Long established firm of engineers has opportunity for man to manage the construction of a large Chemical project.

Minimum of 15 years' experience on similar projects required.

Opportunity of continued employment.

Send complete resume and salary requirements to:

M-83, P. O. BOX 2045
PHILADELPHIA 3, PA.

UNUSUAL OPPORTUNITY

For technically trained men who are looking for jobs with greater challenge, scope and variety.

The Field Promotion Department of the Douglas Fir Plywood Association, completing its expansion to 80 men, has openings in Cincinnati; Detroit; Albany, N. Y.; Providence; Greensboro, N. C.; Jacksonville, Fla.; and Birmingham, Ala. There is also an opening in Tacoma, Wash. for an industrial engineer with experience in packaging and materials handling.
Men living in these areas will have a unique chance to build solid careers in this rapidly expanding industry, fastest growing in the building materials field. They will find the work challenging and rewarding. Advancement is based solely on ability and accomplishment. Travel is reasonable.

Requirements: candidates should be aged 27 to 37, with technical training and experience in architecture; civil, industrial or agricultural engineering; or forest products. They must be willing and able to promote, with vigor and skill, a high-quality product, through personal calls on professional specifiers and major users. They must be able to express themselves orally and in writing. They will earn advancement in fair competition with a group of outstanding men.

If interested, send resume promptly, including present earnings, to:

FIELD PROMOTION DIRECTOR
Douglas Fir Plywood Association
Tacoma 2, Washington

CIVIL ENGINEER

Permanent position as Construction Supervisor

Duties include: **supervise new construction, modification to existing facilities, cost estimates, preparation of project proposals.**

Requirements: **B. S. in Civil Engineering, 10 years experience.**

Send resume to:

Employment Supervisor
Combustion Engineering, Inc.
Naval Reactors Division, P.O. Box 400
Windsor, Connecticut

CONSTRUCTION MANAGER

With heavy experience background in dams, tunnels and hydroelectric projects. Work domestic or foreign. Salary commensurate with experience. Write:

P-3097, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PURCHASING AGENT

needed by Chicago builder in the industrial and commercial field. Will have a free hand in organizing purchasing function in a Company where buying has never been centralized. Construction company experience mandatory. Salary $8,000. to $12,000, depending on experience. *Reply in detail to*

Box 229, Villa Park, Illinois.

TOP ENGINEER - - SEWERS

Construction firm principally New Jersey requires seasoned engineer for estimating and field, contracts to $10,000,000. Full engineering, executive and job coordination with principals. Supply record. Salary open.

P-3715, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• *POSITIONS WANTED*

(Continued from opposite page)

Project Superintendent or General Superintendent capable of expediting complete project with twenty-two (22) years experience with; Superstructure, pre-cast, concrete, concrete, structural steel and all types of cantilever structures. I coordinate all subcontractors including mechanical and expect top pay and benefits. U.S. or O.S. Answer to, PW-3752, Engineering News-Record.

Construction Supt. Thoroughly familiar with all types of construction 20 years experience, 10 in supervisory capacity. Available immediately T. C. DaVania, 1513 Pershing, Salina, Kansas. TAylor 7-3922.

Civil Engineer, 35, ten years exp. in highway and airport construction specializing in asphalt paving. Capable of handling all phases of construction contracts. Desires to relocate in northeast. PW-3751, Engineering News-Record.

Project Manager-Superintendent, age 47, extensive Latin-American experience—Hydro. Structures, Chemical, Sewage, Water Supply, Housing, Mineral Plants, Crushing, Conveyors, Flotation, Diesel Electric Power, Fluent Spanish & Portuguese. PW-3756, Engineering News-Record.

Project Mgr.; Construction Supt. thoroughly capable of office and field organization. 30 years experience, heavy industrial, commercial, mass housing and government red tape. Available immediately. Herb Neyer, 1129 Cloud Circle, Salina, Kansas. TAylor 3-4113.

Construction Superintendent—25 years experience—Pumping Plants, Hydraulic Structures, Irrigation Projects, Highways, Equipment, Sub-Contracts, Planning etc. Investment considered. PW-3757, Engineering News-Record.

Project Manager or General Superintendent, field supervision and general management. Thoroughly experienced industrial, commercial and institutional projects in U. S. and O. S. Now employed available 90 days. PW-3662, Engineering News-Record.

Supt. Const., 20 yrs. Institutional, Commercial, Industrial. Engineer. PW-3621, Engineering News-Record.

Project Manager—Estimator, twenty years with one company. Field and management experience in heavy and industrial construction. PW-3661, Engineering News-Record.

Executive-Engineer. Management and Engineering experience with top consulting engineering firms. Complete charge of Production Planning and Control, Budgeting, Cost Control and Cost Accounting of private and government contracts. Bachelor and Master Degrees. Registered New York State. Desires position with real challenge. PW-3799, Engineering News-Record.

Construction Sup't., or Projects Mgr. Age 36. 14 years exp., bridge const. From drafting table to general sup't., to ownership of $350,000./year gross business. Presently selling out. Available immediately. PW-3817, Engineering News-Record.

Architects Resident Representative or Building Inspector available. Fair Spanish, French. Write Airmail to: "Engineer" Box 42, Rio Piedras, Puerto Rico.

Reg. Eng., Surveyor, 31, Supervise, Estimate public works. Can design, manage. 10 years varied exp. Prefer mild climate. Answer all inquiries. PW-3805, Engineering News-Record.

• *POSITIONS WANTED*

Professor, struct. or civil, 20 yrs. teaching, research, and industrial experience, Ph.D. PW-3615, Engineering News-Record.

Supervising Civil Engineer (Design & Construction). B.S. and M.S. in C.E., M. ASCE and NSPE. P.E. N.Y., N. J., Del., Penn. 20 years responsible experience chemical and industrial plants. Highways and heavy construction. PW-3803, Engineering News-Record.

Construction Engineer, Civil and Mechanical, 12 years of progressive experience including administrative direction of project operations. Extensive background as Superintendent for all types of mechanical and utility work. PW-3806, Engineering News-Record.

Grad. Civil Engr.—5 years exp. in cons't., structural and highway design. Interested in challenging position with future administrative possibilities in the Middle Atl. states or Florida. Will consider sales position. PW-3800, Engineering News-Record.

Office Manager-Accountant, presently employed, desires to locate northeastern New York State. Experience in Public Works and Corps of Engineers contracts. PW-3811, Engineering News-Record.

Mining Engineer, Married, 30, Registered P.E. 18 months construction surveying, drafting. Two years pipeline construction, estimating. Four years sales engineering. Desires engineering position. PW-3824, Engineering News-Record.

Paving and concrete superintendent, age 35—10 years varied experience with Midwest firm—will relocate East or West or Abroad. PW-3826, Engineering News-Record.

Construction Engineer—B.S.C.E., E.I.T., 5 years experience on housing developments, sewer and utility systems, and treatment plants. Desire responsible position with contractor or consultant. Want to locate in East or Southeast. PW-3825, Engineering News-Record.

Project Mgr. or General Superintendent all phases general construction. Not afraid to travel, but would prefer to work out of New England. Sal. Min. $11,000.00 plus bonus & stock options. PW-3828, Engineering News-Record.

Civil-Struct. Eng. with 12 years as a designer and project engineer on highway, bridge, and building projects (with computer experience); wants position in charge of department doing the above work. PW-3830, Engineering News-Record.

Electrical Engineer, BEE Reg. PE. 37 single. Extensive experience in Electrical Construction, Inspection, and design fields. Desires traveling position in construction field. Foreign assignment acceptable. PW-3829, Engineering News-Record.

Chief Estimator, building and heavy construction. Experienced project manager, buyer, expeditor, capable of handling all phases from estimate to closing. PW-3810, Engineering News-Record.

Graduate Engineer-Attorney, 33, married, construction background, knowledge Govt. contracts, seeks position in construction management, will consider anywhere in U.S. PW-3801, Engineering News-Record.

• *SELLING OPPORTUNITY WANTED*

Sales Engineering Representative available for Connecticut. S.E.M. Associates, 6 West Putnam Ave., Greenwich, Conn.

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UNDISPLAYED RATES

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BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• BUSINESS OPPORTUNITY

Opportunity to join and/or invest in mid-western engineering-contracting firm. Growth exceeds capital. BO-3804, Engineering News-Record.

• WANTED

Anything within reason that is wanted in the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

FOR SALE

MECHANICAL CONTRACTING COMPANY

Assets: Machinery, equipment, small tools. Now actively operating in six states in equipment erection, and industrial piping.

Cash requirements for purchase of Stock and sales price $35,000.00 and must assume $21,000.00 in notes payable to SBA and bank. Approximately $75,000.00 in assets involved.

This is an excellent opportunity to purchase an old established company with a long list of satisfied customers.

BO-3712, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

FOR RENT

MC-760 LORAIN MOTO-CRANE

65-Ton Capacity

Maximum Boom Length-170'
Plus 40' Jib

RENTAL EQUIPMENT CO.
5515 Bulwer Ave.
St. Louis, Mo.—*Evergreen 5-8775*

COMPRESSORS FOR SALE

600' Worthington Piston Type Diesel Driven, Completely Rebuilt, $8500.00. 500' Ingersoll Rand with Rebuilt Murphy Diesel $5500.00. Many others. Gasoline Driven 60' to 315'. Write for Prices.

ABBOTT EQUIPMENT CO., INC.
133 Southampton St. Boston 18, Mass.
Phone Highlands 5-6700

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OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.
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K-595, 140' BOOM & JIB
CAT. D17000 ENGINE

50 TON AMER. DIESEL LOCOMOTIVE CRANE. 1946
30 TON BROWNING DIESEL LOCOMOTIVE CRANE
44 TON GEN. ELEC. DIESEL ELEC. LOCO.
25 TON WHITCOMB DIESEL ELEC. LOCO.
60 TON MANITOWOC 3900 CRANE
AMERICAN #140 3D DIESEL HOIST
90 HP LIDGERWOOD 2D DIESEL HOIST
Also Other Constr. & Ry. Equip.

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1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

The Following Equipment is on our yard in Richmond, Virginia

Southern Engineering & Construction Corp.

Telephone Milton 3-9129

1—#250 Parsons Trenchliner Serial 2282, equipped 24" x 12' digging line with 30" side cutters. Also has separate 18" line. This machine as good as new with only four months work. Has set in yard since purchase. Price....$12,000.00
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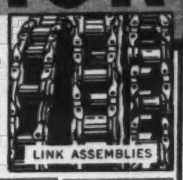

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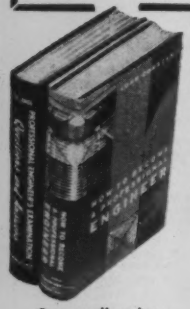

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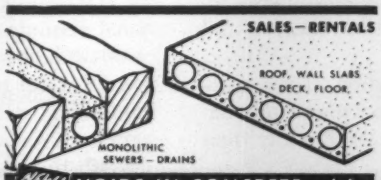

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The Clearance Confusion

MAYBE THE CONGRESSIONAL INVESTIGATORS checking into the Interstate highway program are satisfied with the testimony they heard on how the Defense Department arrived at its request for 16-ft minimum bridge clearances. But the testimony reported left something to be desired.

The engineering mind hungers for facts, finds satisfaction in the logic of figures and, given dimensions, sees problems in their proper scale. But the testimony of the Defense Department witnesses before the Congressional subcommittee so far has indicated that justification for an exact clearance dimension is lacking.

Unsatisfying as it is, the testimony to date may be all the continuing hearings will ever produce on the question of bridge clearances. Those who engineer the Interstate routes and structures may have to accept as a matter of faith the probable need for 16-ft clearance—and the probability that this clearance will suffice. We may never learn precisely what piece of missile gear has what outside dimension that added to what height off the road will total what dimension short of 16 ft.

The Defense Department has spoken. Of course, it spoke once before and said 17 ft. State highway officials at that time accepted on faith the prospect of raising bridges 3 ft above the original 14-ft clearance. Then Defense changed its mind, caused confusion, misunderstandings and delays while it firmed up its 16-ft decision and made it official.

The confusion is past. With resignation, if not complete understanding, the highway engineers can proceed with assurance that no missiles will get stuck under their bridges. Or so it now seems.

Next: High-Strength Reinforcing

THE WAY HAS BEEN PAVED by field experience and research for another step forward in concrete construction—use of high-strength steel for reinforcing. This next advance, like the two previous ones—prestressing and ultimate-strength design—can follow numerous successful applications over many years in Europe.

Efforts to use high-strength steel for reinforcing concrete failed in the U.S. in the past because code-writing bodies refused to allow it high enough working stresses to offset its higher cost. Furthermore, U.S. engineers feared that bond would be inadequate at higher working stresses, and cracks in the concrete would be too wide. They also disliked the steels then available because the high yield point was obtained by cold working; ultimate strength might be only about 10% larger than the yield point. Yet European engineers have been able to use steel at high working stresses—about 50,000 psi—safely and economically.

Recently the situation in the U.S. has changed. The development of deformed bars insures improved bond. Better reinforcing steels have become available; one type —a low-alloy steel having a 75,000-psi yield point—was used in the concrete-framed laboratories of the Portland Cement Association, Skokie, Ill., at a 40,000-psi working stress (ENR Sept. 11, 1958, p. 24). And, finally, ASTM specifications were promulgated last year for high-strength reinforcing steel; they cover minimum yield points of 60,000 and 75,000 psi (A432, A16, and A431). U.S. manufacture of such bars has begun.

To give low-alloy, high-strength steel even more status, tests recently made at Cornell University have provided much-needed additional data on the behavior of beams reinforced with bars of this material. As reported by Prof. George Winter and Eivind Hognestad, of the Portland Cement Association, at the annual meeting of the Highway Research Board last month, crack widths in beams can easily be kept below objectionable values. This can be done by keeping shear strength well above flexural strength, using small diameter bars to secure a high ratio of perimeter to area, and distributing the steel uniformly over the width of the tensile zone.

Prof. Winter and Mr. Hognestad found that the flexural strength of beams with high-strength reinforcement can be predicted reliably and conservatively by the ultimate-strength theory. They also observed that deflections can be estimated with reasonable accuracy by using the transformed area of the cracked sections in conventional formulas and applying factors that take into account duration of sustained loading and ratio of compression steel to tension steel. Finally, they noted that reinforcing steel at high stresses did not cause any significant reduction in shear strength as had been feared.

With this background of field experience and research data, U.S. engineers no longer have cause to shy away from high-strength reinforcing steel. They should be able to use it with confidence not only for buildings but also for bridges and other structures.

The Sewerage-Aid Veto

PRESIDENT EISENHOWER'S VETO MESSAGE on the bill to increase federal grants to sewage plants reflected a conflict of principles. As a matter of principle, he argued that the responsibility for pollution control lies with state and local governments, although the principle of federal aid is already established by the existing $50 million in federal grants. A third principle—balancing the 1961 budget—may have been what actually kept him from approving the increase to $90 million.

Whatever his real reason, however, the veto itself cannot be questioned too seriously. Those who challenge it should remember that the grants were put in the 1956 law as a stimulant to local spending for sewage works. Stimulants used in excess of prescribed quantities no longer stimulate. They opiate. The $50 million per year has been effective. It should continue to be so.

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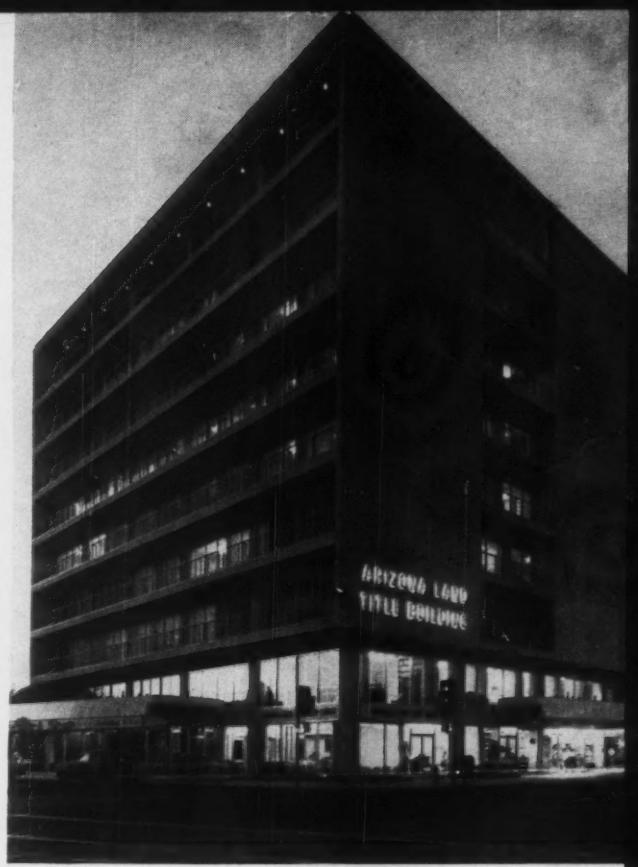

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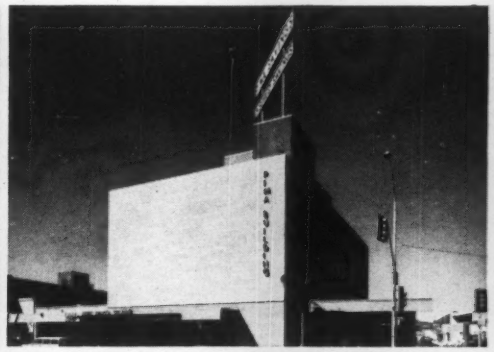

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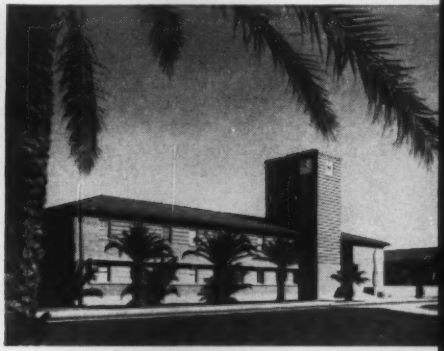

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